

Some Authors have written, That *Cambr* King of the *Sicambrians* was the Founder of this City ; and others observe, that it was the first of those which *Clodion* surnam'd the *Hairy King* of France, subdued in passing into *Gallia Belgica*. A. C. 445. It was heretofore comprehended within the Jurisdiction of the County of *Haynaut*, but the *German* Emperors having, in process of time separated it from that Lordship, render'd it an imperial and free City. It was surpriz'd by *Baldwin* the *Debonnaire*, Count of *Flanders*, during the War which that Prince and *Godfrey* Duke of *Lorrain* maintain'd against the Emperor *Henry III.* to whom it was at length surrender'd according to certain Articles of agreement made between them. Afterward *Henry V.* gave *Cambray* in protection to *Robert* surnam'd of *Jerusalem* Count of *Flanders*, as Prince of *Alost*, and this Right was confirmed on all his Successors by the Emperor *Frederick* in 1164. nevertheless the *French* have often laid Claim thereto, and have sometimes found means to get possession of the Place by force of Arms ; but so far as they govern'd with too great Insolence, the People expell'd their Garrisons in the time of *Lewis XI.* and having introduced the Imperial Force into the City, yielded it up voluntarily to *Maximilian* of *Austria* Governour of these Countries.

In the Year 1543. the Emperour *Charles V.* took the City by means of a secret Correspondence maintain'd between him and the Bishop (who was descended of the Family of *Croui*) put a sufficient Garrison therein, and bridled it with a Citadel which he caus'd to be built at the proper Costs and Charges of the Inhabitants, inducing them to believe that it was requisite to be done to prevent their falling into the Hands of the *French*.

However *Cambray* chang'd its Master again when the Duke of *Anjou* and *Alanson*, the Brother of *Henry III.* King of *France*, was elected Protector of the *Netherlands* in 1582. who had left it in the preceeding Year to *Jean de Montluc* Sieur de *Balagny*. This last adher'd for some time to the Party of the League, and was afterward reconcil'd to King *Henry IV.* insomuch that that Monarch created him Prince of *Cambray*, and constituted him Marshal of *France* in 1594. but the *Spaniards* dispossess'd him of the City within a little while after, and compell'd him in like manner to surrender the Citadel on the 9th Day of *Octob.* A. D. 1595. Then the Inhabitants acknowledg'd *Philip II.* King of *Spain* as their lawful Sovereign. But the Archbishop having made a Remonstrance that he was the proper Lord of *Cambray*, obtain'd a Grant that the Administration of Justice should appertain to him, as also a certain Jurisdiction in the City and throughout the Territories of *Cambresis*, the Protection of which nevertheless, together with the Citadels, should be reserv'd for the King of *Spain*.

Thus the *Spaniards* actually possess'd *Cambray*, which they strengthen'd with regular Fortifications and a strong Garrison, whereby its Reputation was so far augmented, that it hath pass'd in this Age for an impregnable Place. However, it hath been of late oblig'd, among other important Fortresses of the *Low Countries*, to submit to the Arms of the present *French* King *Lewis XIV.* who having taken *Valenciennes* in the beginning of the Year, 1677. afterward besieg'd *Cambray*, and made himself Master thereof, together with the Citadel, on the 10th Day of the Month of *March* ; which was afterwards granted to him at the Treaty of *Nimeguen*.

The End of the Fourth Part.

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The End of the Fourth Part.

1445

OBSERVATIONS UPON THREE EARTHQUAKES.

Its Natural CAUSES, KINDS, and Manifold Effects and Presages;

OCCASIONED

By the last which happend the 8th. of September, 1694. In the Kingdom of Naples, in Italy; wherein several Thousand Men have been Swallowed up, and many Towns and Villages Drowned.

Divided by

Philosophical Theorems, pick'd out of many Famous, Modern, and Ancient TREATISES,

With Reference

To these Two considerable Earthqakes, the First of which happened in Queen Elizabeth's Reign, the 8th. Day of September, 1691. which was sensibly felt throughout all Europe, and some part of Asia in the same Moment: And the last which happened lately the same 8th. Day of September, 1692.

ADORNED,

With an Account of many stupendious and wonderful Events in Germany, Italy, and other Kingdoms.

By J. D. R. French Minister.

Joel 3. 16. The Lord shall roar out of Sion, and utter his Voice from Jerusalem, and the Heavens and the Earth shall shake; but the Lord will be the Hope of his People, &c.

LONDON: Printed for the Author, at Sion's College, near Cripplegate; and to be Sold at Mr. Cockrel, Bookseller, at the Sign of the Three Legs in the Poutry, and at Mr. Vaillant, French Book-seller, in the Strand, over-against the French Savoy's Church, 1694.

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For the ever Honoured and Worthy
Thomas Brown, of *Alsey*, in the County of *Bedford* Esq; a Member of the Honourable House of Commons, in this present Parliament.

S I R,

TIS the custom with those that Dedicate any thing, to adorn their Frontispieces with the Panegyrick Praises of their Mecenas. In which they create Favours, and Illustrate their own Eloquence, unto which I was always averse. But, forasmuch as the great Demonstrations of your Civilities and Benevolence towards my Family, are always in my Memory; my Affections could not but be moved with the Earth, and the Divine Providence at last afforded me an occasion, which I had long sought for in vain, to repay some small acknowledgments of a grateful Mind, by offering unto you the first Fruits of a new Language (the Knowledge of which I attained to in your Neighbourhood) then Dedicate any thing new to you. Nay, 'tis very reasonable that this Treatise should see again the same Country where it began to speak, or rather to stammer.

It is if there were any need to mention more weighty Reasons and pass by these, how innumerable of them, might be afforded, known both to me and the whole Nation, in the enumerating of which a whole Volum might be defective? But that
which

The Epistle Dedicatory.

which hath been the greatest Motive with me, was the Piety innate to all your Noble Family, and to your Illustrious Lady, excelling all others both in Beauty of Body, and in great Parts of Mind. To which may be added the Candor and Constancy of your Mind, free from all secular blemish; which Vertues you know how prudently to use in the exercise of Justice, and the distribution of Right to every one, in punishing Vice and Vicious Persons. On which, and on many other things is founded His Majesty's (the most Prudent of Kings) and his Counsel, Fugment, in conferring on you the Magistracy. The unanimous Concord of the whole Country in chusing you to sustain their Parts in the most August English Parliament, was upheld by this Foundation. On this incorrupted Sincerity, leans the hope of its Patronage, and the Affection of a sincere and faithful Mind, for the Conservation and Promotion of the Present State of Affairs. But many Words become not the Candidate of a Foreign Tongue, especially in so sublime a Matter. Pray, Sir, respect not so much the external Meanness of the Person, as the Gratitude of his inmost Affection, after the Example of that Prince who disdained not willingly to accept of cold Water offered to him in the Hand of a Countryman, his Subject; But having perused this Work, be pleased to accept of it as a Pledge of the eternal Deference I owe to you, and disdain not to embrace it in your Patronage. In the mean time that God will grant an Accomplishment of this, and many other Tears attended with his most gracious Benediction to you and all your honour'd Family, and that the effluxion of this Age may be free from all Commotion and fatal Alteration, either of the Earth, or of the Present Affairs of this Kingdom, is the Prayer of

S I R,

April 9. 1693.

Your most devoted humble Servant,

J. D. R.

THE
P R E F A C E
TO THE
R E A D E R.

THAT common Saying, Objects move Powers, doth not want its Foundation. An Earthquake hath served for the Subject Matter, for the exercising of so many and so great Wits in Old Times, that it may seem needless to bring it upon the Stage again: The Earth was no sooner shook on the 8th. of *September* last, but that, that stupendious Event became the common Argument of the Discourse and Writings of the Learned Men of this Nation. I betook also my self to the Consideration thereof, and so set out the following *English* Treatise, for my private improvement in this Tongue, without any design of publishing it, which should never have come in print, had I not been overcome by the Perswasions of many qualified Persons, and of several others of no ordinary Learning, to whose Notice it came without my Privy, when it was finished; which was about the end of *December* last, and before the Evangelical Exhortation to Repentance, occasioned by the Earthquake
writ

The Preface to the Reader.

writ by Mr. *Beverly*, and the Book of the Learned Mr. *Ray*, concerning the Changes in the World, came forth.

And altho' it seems, that I ought now to be more against printing this Treatise, by how much the more the number of Writers upon this Subject is increased, yet many things being left untouch'd by them, which may give occasion to Publick Curiosity, and to the Wits of this Nation to exercise themselves about, I have here yield to propound to the World. And as there are many Circumstances in which the late Earthquake seems to agree with that, which happened in the Year 1601. both in the Coujunction of Constellations, and the Influence of the Planets, if we may credit Mr. *Partridge*; I thought it not amiss for the satisfaction of the Reader, to give him my thoughts thereon; though I do protest that I am very averse to the Observation of Omens, and that I am of a very different Opinion from those who have dared to foretel that such an Earthquake will be iterated here, as was in *Sicily*. God forbid that we should by our sins draw down his Judgments so heavily upon our own Heads, but rather in our Prayers to beg that God Almighty the Maker and Upholder of Heaven and Earth, would be pleased to grant unto our Monarch and Monarchy the most flourishing Prosperity, that the Constitution of this Kingdom and these happy Islands may be at quiet, firm and unmoveable till the end of Ages.

THE

THE
T A B L E
OF
C O N T E N T S.

That all Earthquakes in themselves, are
contrary to Nature. Their Consideration
is lawful.

CHAP. I.

How many sorts of Earthquakes there are? and in
regard of Natural Causes, what sorts of Earthquake
this was that we speak of, as well in regard of its Circum-
stances, as in regard of its Effects. pag. 3.

CHAP. II.

What was the nearest natural Cause of this Earthquake, as in
regard of its breadth, as in regard of its celerity, videl. the
qualities and dispositions of some fiery and subtil Vapours,
bidden towards the Center of the Earth. To which may be
added the various influences of the Celestial Bodies, as far
as their qualities do prevail or resist. pag. 9.
CHAP.

The Contents.

C H A P. III.

The Earthquake by its Nature hath not an end properly; yet the effects thereof are commonly three specially evinced both by Experiences and Observations of Examples, to wit, Sickness, Inundation and Sterility. To which some would joyn the Presages of some wonderful and unusual Changes, &c.

Pag. 17.

C H A P. IV.

An examination of the Circumstances wherein these two Earthquakes do agree or differ, both in their Form and second Causes, in regard of the different Aspects of Planets as well as in their effects.

P. 30.

As a Corollary, Ten Problems are set rising Naturally from that Matter.

1. *Whether that be true, which Pliny doth assert, that France and Egypt are seldom shaken, by reason of the cold of the one, and the heat of the other?* P. 33.
2. *Why Rivers decrease by Earthquakes?* P. 34.
3. *Why those places that are either lying upon, or encompassed by the Sea or some River, be obnoxious to Earthquakes?* P. 36.
4. *What credit may one give to the relation of Plato, of the Island Atlantis, drowned by an Earthquake?* P. 39.
5. *Whether exterior wind entering the Earth from above is able to move it?* P. 41.
6. *Whether Subterraneous Exhalations are generated by the Sun Beams?* P. 43.
7. *Whether some more fullen times of Earthquakes are to be appointed for any certain reasons?* P. 44.
8. *Why are Birds frightened in an Earthquake?* P. 45.
9. *Whether the Vaults in Houses are safest against Earthquakes?* Ibid.
10. *If in the late Earthquake so ended, that the solemn Conventicles through which it went, are secure from its iteration?* P. 46.

T H E
E A R T H

Twice Shaken
W O N D E R F U L L Y .

T H E O R E M S .

A S Rest is contrary to the Nature of Heaven, so is Motion against the Nature of the Earth.

2. But in this they differ, that although no Natural Cause stops the Motion of the Heaven, yet it may give some Motion to the Earth.

3. The Heaven never rested but once, *Job*. 10. 13. since the Creation that we know of, and then not totally neither, but only in that part which is a Vehicle to the solar Body ; but the Earth is often moved.

4. And altho' the rest of the Heaven be in it self a thing as much to be wondered at, as Motion in the Earth ; yet the later seems to move and terrifie mens minds more.

5. For the Earth doth more nearly touch us than Heaven, and we are more sensible of danger, when the Foundation of the World trembles

and is shaken under us as tho' it were falling, then if any thing happen above our heads, or that which was moved above us move no more.

6. Which Events as they do affect mens minds with a singular, and as it were an amazing Admiration, so they excite and stir them up more diligently to enquire after the Cause of the which, besides our own experience. *Aristotle* Witnesseth in the 1st. Book of his *Metaphysick*, Cap. 2. *διὰ τὸ θαυμάζειν οἱ ἄνθρωποι ἐννῦν καὶ τὸ παλαιὸν ἡγάγαν φιλοσοφεῖν.* Because of Admiration, Men began both now and of old to Philosophize.

7. Seeing therefore that, that Earthquake which formerly happened on the 8th. of September, 1601. between one and two of the Clock at Night, struck almost all the Inhabitants of Europe with Admiration. I doubt not but that which happened lately on the 8th. day of September last, excites many to the search of the Cause and Nature of them.

8. Neither is this tracing, even of wonderful and unaccustomed Events, by their causes any ways displeasing to God, seeing Effects themselves are more clearly understood, when the Cause is known, and the clearer Knowledge of Divine Works, begets clearer notice of God himself, and excites in us a greater fear and awe of him: for clearness in the Understanding begets efficacy in the Will and Ardour in the Affections.

9. Whilst therefore the Learned communicate to the World their Thoughts and Observations of that unusual Earthquake which no small part of the World felt, which Observations they gather from the Remarks they make of the different Events which happened here and there, especially since that Town in *Jamaica* was almost swallowed up by an Earthquake. I have been likewise prevailed upon to put forth something that might be as an earnest, if by chance, by the comparing of Opinions, the cause of this so stupendious an Event might more truly and plainly appear.

10. I shall distribute the whole Matter into Four Chapters. The First of which shall be of the Kind and Form of this Earthquake; The next of the efficient Causes; and the Third of the Effects, and of their Signification and Prefage, at least as ordinary and common. Fourth, To which shall be joyned an Examination of Uniformity or Disparity of one from another, both in their Form, and in their Causes and Effects.

11. **T**Here are two sorts of Earthquakes, Trembling and Pulsation. The differences of Earthquakes or their several Kinds, may be derived either from the Force of the Spirit issuing out of the Superficies of the Earth, or from the sound then made, and from other accidents and effects. Hence it is, that in *Lib. de Mun.* There are reckon'd eight sorts of Earthquakes. *Georgius Agricola lib. 2. de vita subter.* Makes four sorts of 'em, a Trembling when it quivers laterally; Concussion when 'tis moved on high and shelving (*in sublimis & deorsum*;) agitation when contrary blows shake it. Lastly, inclination when it is rowled like Water and the Waves. But the same Author in his fourth Book of those things that proceed out of the Earth, *pag. 14.* more accurately divides Earthquakes into simple and compounded, and then subdivides both into their Species. *Aristotle 2. Metaphys.* reduces all sorts of Earthquakes to two general Heads, to wit to *τρεμνσις* a trembling and *σφαιρσις* Pulsation, which division I thought good to follow in this place.

12. A Trembling is a Motion of the Earth according to its Latitude to the right and left side. *Aristotle* in the forecited place (*say*.) that *τρεψις* i. e. trembling is towards the sides, and calls it also *μαλυσή* and *μαλυσίαν* from *μαλίσ* which signifies to brandish: for the leaping of the Earth is, as it were, a brandishing. And this sort of Earthquake is frequent, but *Pulsus* and *Aritation*, as they call them, are more seldom, which *Aristotle* testifieth in his second Book of his *Metaphys.* chap. 8. *Pulsus* *fieldum* shake the Earth, for beginnings are not so easily multiplied, &c.

13. *Pulsio* is a motion of the Earth according to its Longitude, to wit, when it is moved up or down: *Aristotle* says, *σφύγος ὄρει*, *ἀνω καὶ κάτω* and divides it into *οὐρανίου* & *διαφανίου* *Syssole* and *Diassole*: to wit, either when the Vapour or Exhalation going up with violence, heaps up great Piles like Mountains, or removes or breaks Mountains themselves, or lastly sucks them into the Earth in its vault gaping, as *Pliny*, Speaks.

14. But that Earthquake whereof we have spoken in the beginning, was different according to the diversity of places where it was.

15. In plain places 'twas a Trembling, because it shook the Earth laterally to the right and the left. Those who then felt the Quaking, affirm it to have been a lateral one, like the rocking of a Cradle, and that those who lay in the same Bed, that night it happened, were violently jostled one against the other, the cloaths being carried from side to side; but whether or no, there were the same sort of Quaking in all the places where it was. I am not very forward to affirm. But one may be bold to conclude from the Event, that in most places, the Earth was not violently thrust forward, but did mostly tremble. And although this trembling (*Tremor*) be counted less perilous than either *Pulsus*, Arietation or Inclination, yet it doth not want its dangers, as those specially then experienced that lived in the highest Houses and in Castles, from whence the Voices and Exclamations of the Guards, were heard every where throughout the Country, for when the Cradle is moved too much either to the right or left, there is danger of the Child's falling out, so when the Foundations or Buildings be moved laterally, both the Walls are in danger, especially in Towers where the subterraneous Spirit being included within the Arches, doth as it were, force the Tower more either to this or that side; otherwise the higher the Walls are, the more sensible is the shaking (called, *Vibratio*.) This is certainly apparent from History, that the Town of *Samp*, not far distant from *Florence*, in the Valley of *Magellani*, between the *Fesuvian* and *Apennine* Mountains, in the year 1541. on the 3. of July did first Quake by such a sort of Vibration, and afterwards was so shaken, that most of the Houses were ruined, great Cracks and Chinks being made in them, and 500 of the Inhabitants were destroyed, which Earthquake is related by *Geor. Agricola lib. de Natura rerum & terra effluentium pag. 151.* who Writ his Book the same year the Town was made ruinous.

16. But in Mountainous places, to this Trembling was added a Pulse. Earthquakes are more noxious in Mountains than in Valleys, by reason the more frequent subterraneous Cavities which there lye hid, into which the Spirits are more copiously gathered and prevail more strongly, but especially where the superiours is solidly compacted and smoothly levelled. *Plinius lib. 2. cap. 8.* (says) *Nec montosa salicarent malo*, neither do the Mountains are without such an inconvenience (evil.) I am sure the *Alpes* and *Apennine* Mountains have often trembled, which gave occasion to that of *Virgil Insolitis trepuerunt Moribus Alpes*. And the H. Scripture, says, *Nabam. 1. The Mountains are moved by God.* Swit.

Switzerland also felt it at the very same time. A noted Witness of which speaks after this manner. Whilst I was Travelling in Switzerland in September and October, I found Men's minds terrified more by this Earthquake, than I perceived they were in the more close parts of Germany. And that it was not a simple Trembling of the Earth, but a certain Pulsar and Concussion joyned with a Trembling, those things that I saw every where in those parts, the Effects of this Earthquake, sufficiently demonstrated to me, of which I will mention but one. There is a high and scraggy Mountain two Hagg's Journey distant from Lucern, not very remote from that stupendious Mountain which Pomponius Mela calls, *Frattus Montem*, the Vulgar (I know not by what sort of Superstition) *Pil-lar's* Mountains, but the Inhabitants call it *Burke* (if I do remember) under this Mountain on the Eight of September, about Two a Clock at Night, there arose a dreadful Bellowing and Frigor to the great Consternation of the Inhabitants that live thereabouts, there were elevated into the Air, as it were thick Fumes, which filled all the Neighbourhood; at length the greatest part of the Top of the Mountain was broke off with a great noise, and tumbled down into the Lake of Lucern, which runs by it, but from the other part of the Mountain, which other People (called *Underwaldensers*) inhabit, some part also being violently thrown down, is reported to have buried seven of the Inhabitants, so in the 8th year of the last Age, part of the Mountain was broken off, three hours Journey distant from a certain Village called *Hyborn*, under the Jurisdiction of the Canton of *Bern's*; situated above the Lake *Lemanus*, from which issued a vehement Wind, which carried with it Stones, Clods, and Trees, so that having passed over the interjacent Hills, at the length the measurable Village it self was overwhelmed and oppressed which the Destruction of its Inhabitants. The like Examples do every where occur in History and *Seneca, lib. 6. Nat. quest.* reports out of *Thucydides*, that *Atlas* was cleft and broken by an Earthquake not far from *Lycia*.

17. Moreover one Earthquake is less frequent than another, and more extraordinary; one being purely miraculous, the other compounded both of Miracle and Nature.

18. An Earthquake meerly miraculous is, when the Earth is shaken by the immediate power of God, without the intervention of any Natural Cause.

Of which sort was that which happened at the suffering of Christ.

Matth.

Math. 27. 51. Pliny mentions a certain great Earthquake *lib. 2. Cap. 84.* in the time of *Tiberius Caesar, Maximus*, (say he) *terra memoria mortalium motus occidit Tiberii Caesaris principatu, duodecim Urbibus Asiaque nocte prostrata, i. e.* The greatest Earthquake in the Memory of Men happened in the Reign of *Tiberius Caesar*, Twelve Cities of *Asia* being laid level in one Night. *Cornelius Tacitus* in the end of his second Book, names them. But *Nicophorus, lib. 1. Cap. 17.* saies, Fourteen were destroyed. *Salustius Austin, lib. 2. de mirabilibus Scripturae* Writes that Eleven Cities in *Thrace* were destroyed by that Earthquake, which happened at our Saviour's Crucifixion. *Eusebius* reports from *Phlegon* (an old Author) that many Houses in the City of *Nissa*, in *Bitynia*, fell down by the same Earthquake. But that Earthquake which *Pliny* mentions, could not be that, which happened at Christ's Crucifixion; for they do not agree in the numbers of years, for those Twelve Asiatick Cities fell in the third year of *Tiberius's* Reign, but Christ suffered in the 38th years of the Reign of that Emperor, or thereabouts. Moreover the saying of *Dydimus* is quoted concerning that miraculous Earthquake, which was at the suffering of Christ, who saies, *Terra Motus, &c.* Earthquake often happened, but those which were before and after Christ, were only in some part of the Earth, but in the time of my Saviour Jesus Christ, it was not some particular Earthquake, but the whole Earth was shaken and torn from its Center: But I know not what credit one may give to this Opinion of *Dydimus*. The Scripture saies, the Earth is so founded, that he shall never be moved, viz. as to its Profundity and Center, *Psal. 104. 5. He hath founded the Earth upon its basis that it should not be removed for ever.* A parallel place, to which is in *Eccles. 1. 4.*

That Earthquake also happened at the Resurrection of Christ, is to be referred to those that are purely miraculous, *Math. 28. 2.* as is also that spoken of in the 4th. of *Acts 3. 1.* and that, *Acts 16. 26.* and also that which happened a little before the Promulgation of the Divine Law, *Exod. 19. 18.* and that opening of the Earth that swallowed up *Corah, Dathan, and Abiram, Numb. 16. 31.* And that which is mentioned, *Amos. 1. 1.* and *Zac. 14. 5.* Yea, ye shall see like us, you fled from before the Earthquake in the days of *Uzziah King of Judah*, which, *Iosephus lib. 9. antiq. cap. 2.* describes.

19. A mixt Earthquake, is that which hath a Natural cause, but extraordinarily, as it were increased by God, and in some sort enlarged

larged beyond the Power of Nature. God often makes use of Natural Causes in the production even of miraculous Events, lest the Agents might not be hindered without necessity, and that he might shew that the Power of Nature, and second Causes are not at all repugnant to the Divine Power, but subordinate to it. And, *Lastly*, That he might shew that he hath the Power of Nature in his own hands and disposal, and that he can either augment their force, or diminish it.

20. And this Earthquake is observed to be twofold.

21. One is restrained to some certain Place, and included within some tract of Ground, so that it hath an unusual vehemency of Spirits under-ground, and wonderfully increased, from which arises destructive and great hurt. Of which sort was that Earthquake which happened in the 20th, or as other reckon the 22th, year of Christ, of which we spoke before, whereby 14 Cities of *Asia* perished. Such a one was that also that happened in the Reign of *Heracl*, the Great, by which many Cities, Towns, and Villages being demolished in *Judea*, 30000 Jews perished, as *Josephus* says, in his 1st. Book of the Wars of the Jews, chap. 14. So from the year of Christ, 1170. to the year, 1345. all *Germany* was four times most grievously shaken, as one may see from *Fuencius*, *Stumpsius*, *Sigismus*, *Codernus*, and others.

22. Some Earthquakes are unusual and remarkable in respect of their Latitude and Celerity, so that a great part of the World is shaken, and that some time quickly as it were, in an Hour or in a Moment. Which sort of Earthquake History mentions to have happened in the time of *Valentinian* the Emperor, in the year of our Lord 369. by which the whole Earth was moved, in so much that many Islands in the *East*, with a great multitude of Men perished by Inundation, which is attested by *Socras* lib. 4. Hist. *Eccles.* cap. 32. *Amianus Marcellinus*, in the end of his 26 Book. *Paul Orosius*, lib. 7. Hist. cap. 32. *Fuencius* in *Chronol.* so in the year of our Lord 1117. almost all the World shook, many Buildings being demolished every where by it, as *Stumpsius* relates, lib. 4. cap. 46. but in the year 1443. an Earthquake shook *Poland*, *Hungary* and *Bohemia*. King *Ladislaus* being not long after killed by the *Turks*, with a great overthrow of the Christians.

23. To this sort of Earthquakes is referred that wonderful and unusual one which happened in the year 1601. on the 8th of September, between one and two of the Clock at Night.

24. For

24. For 'tis not probable that so great a Tract of this terrene Globe, as that Earthquake passed through, could be moved by the ordinary and accustomed force of Nature, which not only our *European Hemisphere*, *Germany*, *France*, *Italy*, *Hungary*, *Bohemia*, *Thrace*, but *Asia* in itself is reported to have felt. We have not yet heard for certain how far that Earthquake reached into *Asia* and *Africa*, but this is certain, that the greatest part of *Europe* trembled, and that, almost at the same Moment. Some Reports have lately been hatched, that say, that two Towns, called by the Turks *Tartus* and *Capira*, were swallowed up by the gaping of the Earth, caused by that Earthquake, to the great Consternation of the Turks; who from that time believed that sinister and unlucky Events were pretended to their Empire, which, if true, may make it apparent, that this Earthquake was not every where a Tremor, but in some places a *Pulsus* and *diastole*: to wit, where the Spirits abound, or the Ground is porous or gravelly; as it is about the *Euxine Sea*, and at *Constantinople*, which City, if any in *Europe*, is infected with frequent and pernicious Earthquakes.

In the year of our Lord 1356. it was so grievously shaken, that a great part of the Walls, where it looks into the Sea, fell down, with many Towers and Buildings, so that 13000 Men perished in the City, the Earthquakes lasting incessantly for 18 days. *Agathias*, lib. 5. pag. 541. relates a dreadful Earthquake that happened in this City. A little while before these things happened (in the time of *Justinian*) the Earth was so dreadfully shaken at *Byzantium*, that almost all the City fell down, after which another Earthquake ensued, that was so great, that I think there never was, nor will be the like again.

25. There are therefore two things in that Earthquake which make it extraordinary and very miraculous; the breadth, and that it penetrated those places, which are not subject to Earthquakes: and the Celerity of it.

And although the Mischief is caused in some Parts, may assure us of its vehemency; yet 'tis not so suspensive for its Mischief, as for its Latitude, Celerity, and Prestige. For we read in History of far more dreadful havock and destruction made by some other Earthquakes; and moreover we know from Physical Principles, that those Tremblings that extend farthest, are not so highly distrustful. For the force of Subterraneous Spirits, the more 'tis diffused; the more languid it is.

C H A P. II.

Of the Cause.

26. **V**Hether a Natural Cause can be assigned for both effects we must now enquire.

27. That there was a Natural Cause (although not alone) is evident from Observation.

28. For the time it self is such at is convenient for a Natural Earthquake, to wit, *Autumn*, and also near the *Equinox*, for about that time Earthquakes are wont to happen. *Aristotle 2 Meteor cap. 8.* says, truly Earthquakes happen chiefly in *Autumn*, be cause those times are most Windy : Which *Pliny* also relates, *lib. 2. cap. 8.*

29. It was also two of the Clock in the Morning, which is especially adapted for Earthquakes. So *Aristotle* in the forecited place, says, there are more and greater Earthquakes in the Night, and adds, *ἡ νύξ οἰσθεῖν μέλιστα*, especially in the Morning. And *Pliny* in the forecited place, says, the Morning and Evening Earthquake are very great, but at the approach of day they are frequent, for the heat of the day dissolves and dissipates their matter. Natural cold contracts and binds it.

30. The consequent effects also do Evince that the Power of Nature was present.

31. For noises and fragors issuing out of the Caverns of Earth, were heard about that time in the Neighbourhood, which is a certain discovery of the Spirits and Winds agitated in the Cavities of the Earth, and as it were there striving reciprocally. If but a little Wind blows into a Vessel, a sound, and as it were, a bellowing is heard. One from whence may conclude, what happen in so spacious Caverns as those of the Earth. Hence it is, that *Aristotle* says, The *Spiritus* makes a noise under the Earth, as the Air being beaten up, sounds variously, for there is no difference between this *Spiritus* and the Air (as to the effect of the sound) for this *Spiritus* verberating upon every thing is it self verberated upon : And *Pliny lib. 2. cap. 8.* says, There goes before and accompanies them a terrible noise, otherwise a murmuring like to bellowing or the cry of Men, and the sound fragour of clashing of Arms, according to

the quality of the Matter receiving it, and the form either of Cavern or Cuniculus through which it permeates, &c.

32. Also great Winds have raisen after an Earthquake, when a Calm has immediately preceded it. This is also witnessed by experience, and by *Aristotle* and *Pliny* in the forecited places, that Winds do arise after an Earthquake. because those Winds which where before shut in the Earth, do brake out of it into the Air. And same Author do assert the same concerning the Calm, to wit, that it commonly goes before an Earthquake. In a Calm towards Morning especially, says *Aristotle*, there happen very many and very great Earthquakes, because most of the Matter of the Winds is so retrained in the Caverns of the Earth, that it cannot move the Air: Yet we must not deny that even sometimes in windy Weather Earthquakes have happened, because all the Matter of them doth enter into the Caverns of the Earth together. And even at the time of our Earthquake about three hours before it was observed to be somewhat risen; and I will not here make any tedious dispute with *Geor. Agric.* who says, lib. 4. *de Natura eorum quæ effluunt à terra*, That *Aristotle*, when he mentions the darkness of the Sun, the calmness of the Weather, cold, a thin Cloud extended in length, did not intend to discover the signs of Earthquakes (which *Aristotle's* Interpreters affirm) but prove by those things which sometimes happen, that Wind is the Cause of Earthquakes. But both may be asserted without absurdity, to wit, that they are signs of Earthquakes to come, and also evince that they are occasioned by Wind.

But here we do not only acknowledge Nature, but joyn with it a singular force of Divine Power, neither ought we to sepeare Divine Operations even from those that are usual and often happen: seeing the very Heathens believed that there was no Earthquake, tho never so small, but had something Divine in it, as it is testified by *Gellius* lib. 2. cap. 28. But as often as the Scripture speaks of Earthquakes (which is often) so often do they divert our minds from the consideration of Nature alone, to the acknowledgment of the Omnipotent Power of the Lord, as *Psal.* 60. 2. *Thou hast made the Earth to tremble, thou hast broken it*, and *Psal.* 77. 19. *Psal.* 114. 4, and 7. *Tremble thou Earth at the presence of the Lord, at the presence of the God of Jacob*: Also, *Psal.* 104. 32. *He looketh on the Earth and it trembleth; he toucheth the Hills and they smoke*, *Job.* 9. 6. *Which shaketh the Earth out of her place, and the Pillars thereof tremble*, *Nahum.* 1. 5. *The Mountains quake at him, and the Hills melt.*

33. But what should be the next Natural Cause of so stupendious Effects, to wit, so great Latitude, and so great Celerity in this Earthquake? This I confess is difficult to Trace, but I hope, I shall have leave to enquire diligently into it.

34. Which that I may do, I will first set down some Principles, where one may have good assurance for ones Credit.

35. Seeing the Earth is round like a Globe, it hath Lines drawn from the Center to the Circumference.

36. These Lines meet nearer about the Center, then at the Circumference where they are farther distant.

37. Therefore the nearer any thing is the Center of the Earth, the more closely is it contracted, rushing violently from thence to the Circumference, 'tis extended farther, and occupies more room.

38. The Spiritus or Vapours are sometimes more deeply hid towards the Center of the Earth, but sometimes (and that more frequently) they are generated in Caverns and Passages (*neatus*) nearer the Superficies of the Earth.

From the general Doctrine of Earthquakes in this place; I presuppose the Earth is not otherwise moved then by Winds and Spirits engendred in its Cavities, thence seeking an Exitus according to the quality of their Natures.

I know the Ancient Philosophers before Aristotle assigned other Causes of Earthquakes, whose different Opinions concerning them are recited by Plutarch, lib. 3. *De Placitis Philosophorum*, cap. 2. Seneca lib. 6. *Met. quest. Cap. 4.* Pliny lib. 2. *Cap. 79.* but especially, Aristotle, 2 *Meteor.* cap. 7. But amongst modern Authors Joannes Franciscus, Picus Mirandula, lib. 1. *examinis doctrinae & vanitatis gentium*, cap. 12. among which we must reckon Nicholaus Cusanus, who lib. 1. *de Docta ignorantia*, is of opinion, that the Earth is neither of an Oval form, nor altogether Unmovable of it self. But no Opinion is more evident from Nature and Experience, than Aristotle, who asserts, that Winds and subterraneous Spirits are the Causes of Earthquakes; for the heaviest Bodies are only to be moved by that which hath the strongest Power to move; But among all inferiour Beings, the Wind or Spiritus is that which according to the qualifications of its own Nature, hath in it a Power more effective of Motion than any other body *μικρότερον σώμα*, which is expressly testified by Holy Writs, when it assimilates Angels to the Winds, *Heb. 1. 7.* and many experiments do also evince it: For with how great a force doth a little Gun-Powder dissolved

into Spirits by the heat of Fire burst out of the smallest Machines. So we see the Spirit of new Wine when seething, if the Funnel be stoped, do penerate the Vessels, that they may break forth. It is sufficiently known of what Power they are in our Bodies, and what great Convulsions, Symptoms, and Pains they are, the causes of. So that *Aristotle* useth this Example chiefly to confirm his Opinion of the Cause of Earthquakes.

39. These Spirits being deep in the Earth and closely contracted, the nearer they arrive at the Superficies of the Earth, the more they are dissipated and scattered, and so they extend further in length and breadth.

40. And they more powerfully endeavour to extricate themselves; and they issue out more swiftly, by how much the more they are deeply laid in the Earth, and closely contracted.

Which may be proved by the experiment of Fire, which when it is narrowly contracted, breaks forth the more violently in an instant, when it hath the opportunity of an Assit, to convey it self out, which is apparent in Gun; where the igneous force of the Gun-Powder being shut in a narrow room, breaks out swifter than one can think or imagin.

41. Which Principles being presupposed, let us now shew the Cause of the Earthquake which we are treating of, which extended so far, and was so quickly caused.

42. It was a Vapour or Spirit subtilly disposed and buried profoundly toward the Center of the Earth or at least the Center of *Europe*, or of those Countries that were shaken, whence gallying out in great quantity and number, it spread far and near with wonderful Celerity.

Trembling in the Earth is nothing else but the Thunder in a Cloud, says *Pliny*, lib. 2, cap. 79. As therefore some Thunder reaches further, and issues out more violently than other, both according to the different disposition of the Cloud, and also according to the quantity and quality of the Spirit deeply buried in the Cloud, or approaching nearer to its Superficies; so the greater or lesser Latitude and Celerity of Earthquakes, is to be derived from the different disposition and Situation of the Spirits. And that also, which we asserted of the Center, is easie to be understood: For that which is placed in the middle of a Circle or Globe, doth more easily move the whole Globe, than that which recedes from the Center towards the side of the Globe; which is well known by them who prepare
Fireballs,

Fireballs, and throw them into the Air, often to the great Admiration of the Spectators. And I call that the Center of *Europe*, which is in the midst of that Circle which is drawn from one Extream of *Europe* to the other, in that space of the Terrene Goble in which *Europe* is contained.

43. But whence comes it, that this Spirit is so deep, so subtil, and so swift? Partly from the first, and partly from the second Causes.

44. The efficacy of Celestial Bodies doth deservedly claim the first place among second Causes, which arises from their different respect to one another, or the mixture of their light and rays. Such is the Power of the Subject as is it self, seeing therefore Heaven is the first, cheifest, greatest, and swiftest of all Bodies, its Force and Efficacy must needs be the first, greatest and swiftest; for Heaven is so closely connexed with Inferiour Bodies, that its virtue may be transfus'd into the Earth and communicated to it, even in its most abstruse receſſes: Whither the efficacy of the solar Rays doth reach, is evident from the generation of Metals and other subterraneous Bodies, which is no ways possible without the Sun and its Rays.

45. The efficacy and vertue of *Saturn* this very year was cheifest amongst the Planets, whence it happened that Matter and Fuel was afforded for cold Vapours both above and within the Earth.

'Tis an Astronomical Rule confirmed by experience, that the Knowledge of the Earthquake is to be derived from *Saturn*, it being a Planet effective of cold and dryness; And the first matter of Vapours is cold and dry, which being gathered together at first, by the intervention of other Causes, grows hot and is rarified.

To which may be added the Quadrate Aspect of *Jupiter* and *Mars*, in *July*, whereby cold Vapours are made hot and disposed for windy Temperament. 'Tis an old Opinion confirmed by Reasons drawn from the Nature and Property of Planets; and also from experience, that the Power of the three Superior Planets, *Saturn*, *Jupiter*, and *Mars* is most eminent in producing Earthquakes; the first by his light doth increase cold Vapours, which are made hot by the third, and so tempered by the second, that the heat being neither able to subdue, nor be subdued, there are necessarily generated sturvous Vapours, whereof we shall speak hereafter.

47. And when the Earthquake happened, the Sun was in the Sign of *Virgo*, which is it self very much adapted for Earthquake.

48. There happened in the foregoing Month of *July* two Eclipses,
the

the Moon on the Fifth, the Sun's on the Nineteenth, and no wonder if at that time divers Vapours were collected within the Earth, so that the Rays of the Sun and Moon being weakened by their being obscured, the redundant humour arising from rain, could not be dissolved and consumed, besides all which, the meeting of two Eclipses in one Month is a prefiging Event.

That Earthquake are caused by the Eclipses of the Sun and the Moon; is the Observation of *Aristotle*, 2. *Meteor*, cap. 8. and of *Pliny* after him, lib. 2. cap. 80. which is confirmed by experience, not only the Earth, but also its inmost recesses being penetrated by the heat of their Rays, as by a certain Spirit, are purged from their redundant humours which cannot be when those lights are Eclipsed: For then superfluous humours abound, and also the pores of the Earth which the heat would otherwise open, are shut up, so that the Vapours cannot regularly and conveniently exhale: So says *Aristotle*, 2. *Meteor* cap. 8. Earthquakes happen about the time of Eclipses, for upon the defect of light, necessarily ensues the defect of heat, which is caused by the Sun or Moon throughout the Air. Neither doth that Astronomical Rule want its Foundation; many inconveniencies ensue to the World upon the Obscuration of both the Luminaries of Heaven in the same Month. I don't speake here of that effect of Eclipses which is in *Potensia* and hath its regard to futurities, but of that which is in *Actu* and accompanies an Eclipse considered in it self.

49. To which may be added that which is a nearer Cause, to wit, the Constitution of the Air, which in the preceding Summer was altogether adapted for the Generation of flatuous Vapours.

50. About the beginning of Summer, there was very hot Weather, by which the Earth was prepared and disposed to engender and receive Vapours.

51. Which was followed in the midst of Summer by continual rains, by which the Earth being opened before, by the preceding heat, was so deeply wetted; that abundance of Humours must necessarily have been stored up.

Which concerning the Rain, is attested by *Aristotle* in the aforesaid place, 2. *Meteor*, Earthquake (says he) happen in *Spring* and *Autumn*, but especially in rainy Weather, because then there is a greater Exhalation, which being intercepted in the narrow passages of the Earth, is there shut in; because the Cavities of the Earth are full, but when the Wind is contracted within a narrow place, it has a Power more effective of Motion. And there is a remarkable place

place in the beginning of the Chapter, where he says, that the Earth is of it self dry, yet, but reason of showers falling on it, it hath likewise much moisture which proceeds from the Sun and Fire which is in it self, and engenders much Spirits both within and without it self. Neither is there any reason why any one should object what *Seneca* says, in *quest. nat.* That no rain is so great as to penetrate or Wet the Earth above two Foot : For that is not true of every shower of rain, nor of much and continued rain, neither in the Superficies of the Earth, the only conveyance of rain into the Earth, but it also is carried through the Caves of the Earth that are open and is in great plenty infus'd into the inmost Recesses of the Earth, by Fountains, Wells, and Rivers which are increased by rain.

52. To which rainy Weather was added an unusual cold in the *Dog Days*, by which the Passages and Pores of it were so shut up, that the Humours gathered together in the Earth could not evaporate.

53. And the *South-West* wind blowed for many days together, so that the Vapours accommodated for an Earthquake were entreated and nourished. For the *South-Wind* is warm and moist, so that it hath been rightly observed by *Aristotle*, that it is apt both to excite and nourish the matter that causes an Earthquake; and as the *South-West* Wind is near in place, so in temper and effect.

54. Which cold Weather was presently followed by a calmness and heat a little before the end of *August*. So that the Vapours which had been generated by continual Rain within the Caverns of the Earth, grew dry: And a Vapour made warm becomes a flammable. And when there arise such contention between cold matter and heat, in which the cold is neither quite overcome and consumed, nor the heat is altogether conquerour, winds are engendered. Which is rightly observed by Physicians in the Bodies of Men, when heat acting upon Phlegm cannot totally consume it, then are generated Winds.

55. It could not be but that the Vapours contracted within the Earth by the opposing cold, both proper to the Earth, and also caused by the internal Constitution of the Air, should be deeply laid. No otherwile than if the Spirits are more deeply concealed and constrained, when the coldness of the Clouds doth resist and constrain more stiffly.

56. The subterraneous Fire scattered through the Cavities of the Earth, so heated these Vapours shut up in the Earth very deeply, that it made them more subtil and more agil, the Caverns through

through *Europe* and other places being disposed for it, for the Reasons a fore mentioned.

That there is Fire every where scattered through the Cavities of the Earth, both the Fire which in many places breake forth out of the most profound Caves of the Earth doth evince, as also the hot Waters or Baths which rise in many places, to add nothing of the engendring of Sulphur, Brimstone, and other Minerals, in which there is an igneous force and nature. The burning of *Aetna* equally celebrated by Poets and Geographers, is described by *Solinus*, cap. 2 *Pleny*, the Nephew of that *Pliny*, by his Sister whose death the *Vesuvian* Mountain caused, says lib. 2 *Epist.* 'Not long since the Island *Georgia* (one of those Isles they call the Third) shaken by a dreadful Earthquake and gaping, there issued out some much Flame, so many hot Stones, so much Sulphur and burning Brimstones which were thrown into the Air, that many Houses were burnt, Inhabitants destroyed, Vine-yards and Gardens quite desaced. But whence come so many Flames under the Earth? From the dry Vapours which being so closely press'd in the Earth, and from several motions and agitations in it, Fire doth necessarily Kindle: For Fire, says *Aristotle*, is lighted smoke. About the year 1541 Fire broke out of a Mountain named *Elisæum*. *Gregor. Agri-*
cola de i. igne effluunt è terra lib. 4. pag. 152. And *Strabo* Writes, that so great Fire issued out of the Earth, that some Towns were consumed, and among them *Sodom* at the Lake *Asphaltites*: But we are taught better by *Moses* in his sacred History. Moreover as our Fire when 'tis shut in, is moved up and down by a various Reciprocation, some doubt not but subterraneous Fire is diversly excited, and sometimes flies downwards into the most profound Caverns, and sometimes upwards, towards the highest Parts of the Earth, as the Earth is variously changed and disposed by Heaven and the Air.

57. And these I take to be the second Causes of that Spirit which lately shook the Earth so swiftly and so deeply, which yet could not likely produce so unusual an Earthquake, by its Natural Power alone.

58. To which was added that chief and first Cause, God, who by an extraordinary way of acting, wonderfully increased the strength of that Spiritus generated within the Earth, and added one degree of force to it beyond its own Power, which Nature could not add, so that this Earthquake may be reckoned not purely Natural, but mixt with both, as we asserted before. For all Miracles

acles do not exclude Nature, but many include it, so that they increase its force and virtue, and extend it to that degree, to which it could not attain unless the Almighty Power of God, were superadded. The Scripture doth propose unto us an evident Example of it in *Sampson*, whose prodigious strength by his bodily Temper, and all his Sinews and Muscles were so exceedingly strong; However God himself did reinforce and increase them so much that he could rent into pieces a young roaring Lion like a Kid, *Judg. 14. 7.* that he could break the strongest Cords like a Linnen-thread or Flax; that he could slay a Thousand Men, with the Jaw of an Ass, *Judg. 15.* That he could take the Doors of the Gates of the City, and the two Posts, and carry them up on his Shoulders to the top of an Hill, *Judg. 16.* So the Divine Power of God did increase the natural strength of *David*, that he could overthrow this prodigious and Stronglimed body *Goliath* with a Sling only. *1 Samuel 17.* To the same kind of Miracle we may refer the Example of *Elijah. 1 King. 19.* where it is said, that having eat a Cake and drank Water out of a Cruise, he was so sustained, that in the strength of that Meat he went forty days and forty nights unto *Horeb, the Mount of God.* There are evidences enough throughout all the Doctrines of Divines concerning the variety of Miracles, their many sorts and their ends to shew that these strengthening and reinforcing of Natural Faculties, though supplied by God, may fall out also on our Ages, as we have observed in a few words before in the nineteenth *Theorem.*

C H A P. III.

Of the Effects and Presages

59. **A**Lthough those things which happen contrary to Nature, have not an end properly and perse out of Nature, yet they have their effects presages, and portenta, When Earthquake happens besides its Nature, it cannot have an end properly, and perse in respect of the Earth. For the end of every thing is according to its

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Nature,

Nature, 2. *Phys.* 3. But in respect of the Vapours or Spiritus by which the Earth is moved, this end is assigned by Naturalists, that the nature of that Spiritus may be preserved whilst falling out of the Earth, it ascends into the open Air, making its own way out of the Caverns of the Earth, in which it was included as in its Prison, so gaining a place proper and agreeable to its own Nature.

60. And seeing this Earthquake is mixed with Nature and Miracle, it hath Natural effects, and also its Presages from the supernatural Ordination of God.

61. The effects will be as is the Cause, to wit, Praternatural, that is contrary to Nature.

62. Three of which effects are more especially to be feared, which both the Nature of Earthquakes, and Experience, and the Observation of Examples do evince, to wit, Sicknes, Inundations, and Sterility.

63. Earthquakes cause Epidemical and Contagious Distempers, because the Vapours in the Caverns of the Earth either contract rottenness or some venomous qualities (especially if shut up in it for any considerable time) and thence falling out, they make impressions in the Air that surrounds us, which when drawn into our Bodies by breathing, there must needs be impressed the like qualities in the inmost Bowels of our Bodies; Neither do they only infect the Air, but also the Water without which we cannot be. That the quality of subterraneous Vapours is very prejudicial to our Health, is testified by experience in those places where the Earth abounding with Minerals, sends into the Air frequent Exhalations, but especially if the Earth be porous and loose. Neither need we go very far for Examples: Those Caverns which are at the Sharp, and the Fountains of *Schwalbub* may testify it, which are so much infected with venomous Exhalations, that Dogs or Hens carried into them, die sooner than any one can imagine. *Geor. Agric.* hath Writ accurately *lib. 2. de nat. rer. è terra effluent.* When at the beginning of the Book he Writes, the Air which is shut up a long time in any Concavity of the Earth, rots and is made pestilent: And a little after; there are in many places of the Earth scrobes, exhaling mortiferous Vapours, but no where more then in *Italy*, &c. *Cardanus* also in the Appendix of his Work *de Rerum varietate*, explains the thing by some Histories and Examples. Moreover the History of all Times teacheth us what grievous and pestilent Distempers have been caused by Earthquakes. *Seneca lib. 6. quæst. natu.* attests that a Flock of 600 Sheep was destroyed by an Earthquake in the

the Province called *Pompeia*. Sheep being of a very soft nature and carry their heads near the Ground. In the 19th. years from the building of *Rome*, after an Earthquake, followed a Plague, which lasting three years, there died at *Rome* 30000 men. So in the year of our Lord 748. after an Earthquake in *Palestine* a great Sickness was prevalent in *Sicily*, *Greece*, and *Thrace*.

And in the year 801. when *Charles* the Great was invested with the Empire, Upper *Germany* was infested with a vehement Earthquake, but especially the Coast of the *Rhine*, which was followed by a Pestilence, which dreadfully afflicted *Germany* and other Places. *Stump. lib. 4. cap. 21.* So in the year 1309. on the Feast of the Conversion of *St. Paul*, all *Germany* shook, and the Plague afterwards raged throughout the Country, so that 60000 men are reported to have died at *Florence* and 90000 at *Lubick*. That God the Father of all Mercy would grant, that no such consequence may happen from our late Earthquake, and that the Epidemical Disease which now infest these Places, so near to a kind of a putrid and malignant Fever may not be converted into a more dangerous Distemper. The unlucky Eclipses and Positions of the heavenly Bodies this years portend some such things in other Countries. The Northern Latitude of *Saturn* in the Sign of *Scorpius*, and those four Eclipses of the foregoing year, two of which happened in the Month of *June*, whereof that of the Sun was a stupendious one for its Magnitude, will exert their Operations this year as the Masters do reckon.

But that the Waters are also polluted by those Vapours is known by the Fountains, which both before and after Earthquakes are wont to be impurer and thicker. Which is also attested by *Pliny, lib. 2. cap. 81.* where, he says, The Water in Wells is thicker and not without a loath some smell, which odour is Sulphureous and metalline, from whence one may certainly conclude that some Vapours falling out of the Earth, have mingled themselves with the Water. Hence it is, that *Pherecydes Pythagoras* his Master foretold an Earthquake by drawing some Water out of a Well, concerning which *Pliny* Writes, as by some Divine Presage, *lib. 2. cap. 29.* Which *Cicero* mentions 1. *de Divinat. Geor. Agricol. lib. 4. de efflu. è terr. pag. 153.* think that muddy Water in Wells is most commonly a Sign of an Earthquake already begun, and he believes that no proper and certain Sign of future Earthquake can be assigned, for those that are delivered by Writers are either the Sign of an

Earthquake just begun, or its Modus; so that they may happen without a future Earthquake.

64. Overflowing of the Earth are therefore wont to ensue Earthquakes, because the Exhaltations violently sallying out of the Earth, break the Veins and Caverns wherein the subterraneous Waters are shut up, so that Water is in a more abundant manner driven into the Veins and Springs of Fountains and Rivers.

This is confirmed by *Aristotle*, 2. *Meteor. cap.* 8. Exhalations breaking forth with great Force, carry along with them whatsoever Water there is in their way; and he adds in the same place, that the Winds that blow the contrary way are the Cause of it, because the Spiritus shaking the Earth, it cannot repel the Sea brought against it by another Wind. Examples also observed in History, prove the same. For *Procopius*, lib. 3. *de bello Gothorum*, pag. 383. describes the unusual Inundation of *Egypt*, as arising from an Earthquake. About that time a great Earthquake happened which shook all *Beotia* and *Achaia* and the other places, about the *Sinus Creteus*, and also an infinite number of other places and levelled eight Cities to the Ground. And the Earth in some places when it had gaped extremely, came again to its former state, but in other places it remained so much cleft, that the People of that Country were forced to make a large Circuit to converse with one another. But in the narrow Sea between *Thessaly* and *Beotia* there arose so great a Commotion and so great an Inundation, that great desolation was made both of Mountains, Edifices, and Men. In the second year of the Reign of *Flav. Valentinian* and *Valens*, the Sea so swelled that overflowing *Sicily*, it Buried in its Waves several Towns and Villages. In the year 1508. an Earthquake was followed most grievous Inundations throughout all *Italy* and *Germany*. And wish we might take example and experiment of that calamity from the late Earthquake, that we might be brought to repentance.

In the same place 'tis said, 'We have news daily of the most pernicious Inundations through the Dutchy of *Juliers* and *Claves*, and 'the Oriental *Friezland*. We have been eye Witnesses of the unusual increasing of the River *Neker*, which overflowed in *December* and *January*, with a considerable damage.

How the *Rhine* hath overflowed, the Inhabitants know to their own sorrow and loss, where that unusual Inundation proceeding from the River and Rivulets in *December*, between *Straisbourg* and *Spires*, as it was fatal to several persons, so among the rest to the head of an Ancient Family.

65. Lastly,

65. *Lastly*, Barrenness is the consequent of an Earthquake, because of the envenomed Vapours which while they permeate the pores of the Earth, leave behind them their Venemous Footsteps, and imprint their Qualities both on the Earth it self, and also in the Seed, whereby the enlivening Power fit for the production of Corn is corrupted. Wonderful and different were the Sentiments of the common sort of People after the late Earthquake, as is usual; and Husband-men were every where heard interpreting this Earthquake as a Joyful Omen of a singular future Fertility. But this Conjecture is easily refuted by the consideration of Natural Causes, especially since History attests the contrary. For in the Year 315. from the building of *Rome*, so great a Scarcity and Barrenness followed an Earthquake, that *Livy* mentions it as remarkable that many threw themselves into *Tiber*, where they made at one another to devour themselves. In the Year of our Lord 542. an universal and most grievous Famine ensued upon an Earthquake, that was it self almost universal, as says *Paul Diaconus*, lib. 16. The same happened in the Year 1326. and again in 1033. But as a Plague and Inundation do not follow an Earthquake *ἀναγκαίως* but *ὡς ἐπὶ τὸ πολὺ* so neither do Barrenness and Famine: For as the Subterraneous Spirits are not always equally disposed, so sometimes they are less envenomed and destructive and more subtil, that they exhale sooner, neither do they so easily imprint on the Ground any quality noxious to the Fruit, which that we may experience in this Earthquake the next Harvest, let him alone who is able to crown the Year with his Blessing grant.

66. And as this Earthquake was not only natural, but of kind to a miraculous one, so also seems to contain in it the Presages and Portenta of some wonderful and extraordinary Changes among Mankind. I said before that God added a Supernatural force and degrees to the Natural Causes of this Earthquake. And God doth nothing in vain, but direct all to some certain end and scope, so that 'tis necessary something should be in this Earthquake more than could proceed from the power of Nature alone.

67. But as Comets do not of themselves and their own nature cause or denounce any Change in Kingdoms, and any other Humane Affairs, so neither do Earthquakes; but such events happen in these wonderful and secret Works of Nature from the disposal and Ordinations of God, partly exciting Mens Minds and premoving them, partly terrifying them with those fear of Futurities. The Rainbow of its own Nature can neither be a surety for, nor confirm

firm the Grace and Covenant of God to the World, that there shall be no more an universal Flood, but it doth engage for, and confirm it by a supernatural Revelation, which the gracious Counsel of God imposed on this work of Nature. The same must be determined of Earthquakes, Comets, Chafins and other wonderful Meteors in Nature.

68. But what change in *Europe* doth this Earthquake presage? This neither I nor any body else can easily tell. He alone knows who endowed the Earthquake with the signification of Futurities, who encreased and augmented the Power of Nature; and lastly who hath at his own dispose, both the Causes and their Effects.

69. The Scripture, as far I could observe, speaks of Earthquakes after a three fold manner.

70. Sometimes as of the Sign and Symbol of the present Grace of God already held forth. As was that Earthquake by which the Apostles and other Members of the Primitive Church were confirmed against the intermediate Assaults of their Enemies, by the hearing and the presence of God from Heaven, of which *Acts* 4. v. 31. *But when they had prayed, says Luke, the place in which they were Assembled was shaken, and they were all filled with the Holy Ghost.* To which is to be referred that Earthquake that happened at the Resurrection of Christ, the Angel of the Lord descending from Heaven, and Rowling away the Stone from the mouth of the Sepulchre, of which, *Matt. cap. 98. vers. 2.* makes mention. To the number of these Earthquakes doth also belong that which is mentioned, *Acts* 16. vers. 16. *But in the middle of the night, Paul and Silas were Praying and Singing of Psalms, when on a sudden there was a great Earthquake, so that the Foundations of the Prison were shaken, and the Doors were opened, and all their bonds were loosed.*

71. But as such Earthquakes are seldom, so they are meerly Miraculous: and such Examples are not easily to be found either in the History of our own or former Times: For the Sins of Men deserve o herwise.

72. But the Scripture often speaks of an Earthquake as of the Messenger and Witnelis of the Divine Wrath, and the presage of Punishment to certain Kingdoms and Provinces for the Publick and Private Sins of the eminent Ones. The Scripture scarcely ever speaks more frequently of any presage of the Wrath of God and impending Punishments, than of an Earthquake, as the 2d. of

Sam.

Sam. 22. vers. 8. Psalm. 18. vers. 8. The Earth is shaken and m^oved, because his Wrath is Kindled. Job 9. vers. 5, 6: Who removes Mountains, so as he is not observed; who overturns them in his Wrath, who moves the Earth out of its place; So that the Pillars thereof shake. So Ecclef. 39 32. There are Winds created for punishment, in the consummated time they pour out the strength and fury of him that made them. And the like places in Joel 2. 1. Na. 1. 5. Amos 1. 1. Zac. 14. Numb. 16. 21. And God was pleased to promulgate his Laws by an Earthquake, Exod. 19. 18. That he might testify that, that punishment was ready for the breakers of them. To which must be referr'd that Earthquake which happened whilst Christ suffered, Matt. 27. 51. The Earth, says he, was moved, and the Rocks were split; which was also a Testimony of Christ's Innocence. John in the Revela. denouncing the Wrath of God and the punishments which are to be poured forth on the later days, makes often mention of an Earthquake, cap. 6. 12. Cap. 8. 6. cap. 2. 13. There was, says he, in that hour a great Earthquake, and the tenth part of the World fell, and there were kill'd in the Earthquake 7000 men, and the rest was terrified and gave Glory to the God of Heaven. cap. 16. 18. There was a great Earthquake, such as never was since Men were on the Earth, an Earthquake, says he, so great. Which sayings although they have an Allegorical interpretation, yet they may be taken properly; or at least they will lead us to this, that the Scripture doth commonly represent destructive punishments and calamities by an Earthquake.

73. For nothing seems to be a greater punishment and calamity to Mankind, than an Earthquake.

74. For all other fatal punishments are wont to ensue upon an Earthquake, and we may sooner foresee War, Famine, and Pestilence, and so take heed of, and avoid them by preparing proper Remedies, than we can foresee avoid and fly from an Earthquake: seeing the Spiritus in the Earth is not restrained by any Humane force, neither can we fly away from the Earth. Hence it is that Experience witnesseth, that Brute Beasts and Men are terrified by nothing so much as by an Earthquakes; so we see that even the most savage and cruel Hearts of Tyrants, that have their minds hardened most against God and Men, have been terrified by Earthquakes. There is extant in *Josephus*, a memorable passage concerning this, *lib. 1. de bell. Jud. cap. 14. and lib. 15. Antiq. Jud.* Where *Herod* a despiser of God and Men, thus Speaks to his Army. *Let not the Fear of*
inanimale

inanimate things at all terrifie you, nor imagine that Earthquake is an
 omen of future destruction; for the defects of the Elements themselves
 are Natural, and infer no other loss than, that which they cause; so
 that when they do happen, they are ended by their own greatness. These
 Prophane Speeches did the Tyrant then utter, whilst he himself was
 so astonish'd in his own Mind, that he offer'd Sacrifice for the ap-
 peasing of God, as *Josephus* mentions in the same place. The
 Heathens being always terrified by Earthquakes, began then in ear-
 nest to think of appeasing God, and rightly of instituting their Sacri-
 fices. Hence it is, that *Pliny* saith, *lib. 2. cap. 84.* For there is
 not only in an Earthquake some simple evil and danger, but an equal
 or greater Omen of something to come. The City of *Rome* never
 trembled (yet it shook in the year 537. about fifty seven times) but
 it was the Omen of some future Event. Therefore that impious say-
 ing of *Seneca* is repugnant to the Sense and Conscience of Mankind.
 The Gods do nothing of these things, neither is the Heaven or the
 Earth shaken by the anger of the Deities. So *Gellius, lib. 2. cap. 28.*
 What is the Cause of Earthquake, is not yet manifest: Therefore
 the Ancient *Romans*, when they either perceived or were told that
 the Earth shook, commanded by their Edicts that Holydays should
 be kept, but in the publishing of them did not name the God as is
 usual, for whom the same were to be kept, and *Marcus Varro*, says,
 'twas so observed by the Decree of the Priests, because 'twas un-
 certain whether the Earth trembled by the Power of the Gods or
 Goddesses. There is extant in *Rosinus*, the History of some Supersti-
 tious expiation, *lib. 4. pag. 66* where he says, That grievous Earth-
 quakes ensued upon the Death of *Valentinian*. *Crete* was vehemently
 shaken with all *Peloponnesus* and the rest of *Greece*, except *Athens*
 and the Country thereof, which they say, was saved by this means.
Nestorius the High Priest saw in a Dream the *Athenians* advis'd to
 prefer the Hero *Achilles* to the highest Honours, for this would be
 most advantageous; he therefore being taught by Divine Speculations,
 after having performed a solemn Sacrifice, plac'd the Image of the
 Hero under *Minerva's*, so was *Athens* and all its Land free from
 the Earthquake. There is a parallel place in *Synesius Cyre. Epist. 61.*
 of Devotion in the time of Earthquakes. God often (says he) 'caused
 'an Earthquake in the day time, and Men stood commonly upright
 'whilst they pray'd, for the Ground was shaken w^herefore thinking
 'the Sea was more severely shaken than the Land, I ran to the Heaven,
 &c. But the Christians of the Primitive Church us'd not to fly to
 any

in an more things at all terrifie you, nor imagine that Earthquake is an
 omen of future destruction; for the defects of the Elements themselves
 are Natural, and infer no other loss than, that which they cause; so
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any unknown God, but to the true one that shakes the Earth and implored his Grace and Mercy; an Example of which pious Custom is related by *Justinian* the Emperour, who when he heard that *Antiochia* was shaken by a grievous Earthquake, in which a great number of Men had perished, presently laid down his Robe and Imperial Robes, and put Sackcloth and published an Edict whereby he commanded his Subjects to Fast and Pray for many days, and to do all other things, which testify a serious repentance. *Socrus. lib. 6. cap. 2. Sulp. lib. 7. cap. 28.*

There is extant also an Epistle of *Adrianus Augustus Antoninus* to the People of *Asia*, wherein he exhorts them not to lay the Fault of the Earthquake upon the Christians, but rather religiously to invoke after their fashion the Author of the Earthquake, 'It will not be absurd,' continues he, 'to comfort your sorrow by a just warning, for I have found out that in such occasions you do ascribe this ordinary Cause to some motive of envy, that the God, whom they trust much to, may have; and whilst that you know not the Reason thereof, you do neglect every time the Worship of the other Gods, and so you endeavour to put away and cast down the Worship of the immortal God, whom the Christians do adore.'

And there is no doubt but that many pious Men every where through Germany and other Countries, devoutly and religiously followed that pious Custom of the Ancient Church, and stirr'd up themselves to serious Repentance and ardent invoking of God's name: which effect if it hath not happened in all, yet the thoughts of the Evil which have in all Ages ensued upon the Earthquake, ought still to stir them up and awaken them to true repentance, seeing these effects have been observed by the most severe Winters of Earthquakes. For it is not rash to say that commotions of the mind follow an Earthquake, as a Shadow the Body. Neither does it want its natural Cause, for 'tis certain that the Air we draw in, have several change of alteration by Earthquakes, and the Temperament, and so the characters of Men are much affected with the temperaments or intemperaments of the Air, and they are disposed by it, if we believe the most skilful Physicians, and our own experience. Histories are full of Examples, of which I will instance but one or two. *Babylonia* trembled about the time of the *Peloponnesian* War (which was called unmoveable by *Pindar*, as *Seneca* relate out of *Callisthenes. lib. 9. Nat. quest.*) Whilst *Brenno* was attacking the *Dilphian* Temple, there happened so great an Earthquake, and so great a Tempest mingled with Hail and Rain;

that the *Gaulois* Army were almost overwhelmed. Earthquakes happened often in the *Carthaginian* War, so that 'twas said at *Rome*, an Earthquake happened 57 times in the same year, in which the *Romans* and the *Carthagians* fighting at the Lake *Trafimenian*, were neither of them sensible of a great Earthquake which was there, *Flin. lib. 2. cap. 4.* and in the 83. he says, *That two Mountains ran against one another, rising and retiring with a great noise, by which concourse all the Towns were dash'd to peices and Castles between kill'd,* which was in the year before the *Social* War, and says he, *I know not but it may be more fatal to Italy, than the War.*

In the year of our Lord 369. many Earthquakes happened every where which were followed by a most severe Persecution under the Emperour *Valentinian*, as is attested by *Hierome* and *Ensebins*. In the year 455. a remarkable Earthquake preceded those dreadful devastations of the Country of *Attila*, as is Witnessed among others by *Stämpf. lib. 4. cap. 54.* So in the year 841. *Herbipolis* shook about twenty times, upon which a bloody War ensued between the Emperour *Lotharin*, and his Brother. So in the year 1171. a War broke out between the *French* and *Sweedes*, when several Earthquakes had preceded it every where through *Germany*. So in the same year 1171. a great War arose between the Emperour *Frederick* the I. and Pope *Alexander* the III. In the year 1372. on the first of *June*, a dreadful Earthquake shook *Germany*, and a little after ensued a grievous War in *Bavaria* and *Switzerland*. Also in the year 1384. on *Christmas's-Eve*, the Earthquake shook, and a little after ensued the dreadful War of *Leopol* with the *Switzers*, which was both destruction to the House of *Austria*, and fatal to the Young Prince *Leopold*. In the ye r 1521. before *Belgrade* was taken by the *Turks*, the Neighbourhood shook for 3 days together, and many Houses fell down every where. I cannot but set down the Words of a wise old Man, *Gasp'r Peucer*, which are extant in his Commentary of Divinations, pag. 389. 'The Mountains of *Suda* and the Towns built there felt: Not only one or two, but continual shakings of the Earth (which says History always denounce great Wars and destructive Seditions) the Houses shaking as if it proceeded from the distinct impulse of Winds. These things undoubtedly threaten dreadful destruction and calamities, which I pray God mercifully mitigate for the sake of his Church, and spare the innocent and guiltless Ages for the sake of his Eternal Son Jesus Christ. But there is another Example fresher in our Memory, viz. of the year 1590. when some parts

of *Germany*, especially *Austria*, *Bavaria*, and *Misnia* were shaken, which Earthquake is the more remarkable and worthy to be compared with the late one, because it happened almost at the same time, viz. on 5th. of *September*, and because a little after the *Turkish* War grew more outrageous in *Hungary*. And lastly, because a little after, as it were the three supporters of *Germany* fell down. First in the same Month the Earthquake was, viz. *September* the 2 5th. *Christian* the Elector of *Saxony* died, and 'tis still fresh in the History what disturbances ensued upon it, in the *Saxon* and *Misnani* Churches. Not many months after *John Casimir* the Administrator and Tutor of the Elector *Palatin* died, who came behind none of the most Valiant Heroes. And lastly, *William* the *Landgrave* of *Hesse*. The loss of which three Princes in so short a time, all prudent Men thought ominous to *Germany*, as they do still, for that *Germany* seem not yet either to have sham'd or overcome that Omen. Neither shall I here mention those Wars which *Moschus* again in the same year stirred up in *Lisland* and *Sweedland*, nor the death of those Eminent Men *Francis Hotoman*, *Cujacius*, and some others, nor that which happened in *France*, the Siege of *Paris*, which continued for many months together, neither will I mention that two years afterwards, viz. in 92. seven other *German* Princes besides *Casimir* of Excellent Memory, were taken out of this World, and that a War arose between the two Elect Bishops of *Lebert*, while the Canons disagreed about it; and that in the same year, *Clement VIII.* was chosen Pope, who was formidable for his craft and cunning. Which things seeing they are all thus experienced, let us stir up our minds to serious and fervent Prayers, and to the Observation of the sinister Omens of the last Earthquake, and while we are deprecating the Portenta, let us prepare our selves for future Evils and the fatal change of *Europe*, foretold us by this Earthquake, and foreseen by Wise Men. For it is possible either to shun decreed misfortunes either publick or private, or to render them more mild by piety, reason, due remedies applied from Counsel, and by opposing good contrary to those Evils. But let us consider that there are two sorts of Motions in the Spirit of Mankind. There are some motions in the good Spirits, and some in the ill-natured and wicked ones. And as it happeneth that the ill-natured Spirit do stir themselves for the ruine and destruction of the best settled and ordered Kingdoms and Empires. So it happeneth often that God stirs up some profitable and convenient Motions in the Spirits of the greatest Princes, or

in the Republicks, 'wherewith all the evil design and machinations of the wicked are happily broken, and a good Peace and Tranquillity is procur'd as well to these Kingdoms, as to the Church. To which we may refer this great Revolution lately happened in this Kingdom of England.

A little before this Earthquake which happened in *France*, in 1601. the *Dauphine Lewis* the XIII. was born in that Kingdom, and at the very hour of it the late Elector *Palatin* had his Son born.

It is commonly said, that motions of Heroick-souls are great and easie. Neither is History defective in Examples of the Birth of great Heroes and Princes born just at the time, when there were Earthquakes. Writers, says *Hercules*, was born whilst the Earth was shaking although I am not ignorant what credit is to be given to the History of *Hercules*; yet this is apparent from the Relation, that the Ancients thought that an Earthquake was an Omen and Presage of a great and Heroick-soul in those whose birth happened at the same time. But there are other Examples of Earthquakes extant in History, by which God hath (as by a portentum) attested his wrath against the enemies of the Righteous, and his favour to the Godly, by some joyful Omen. *Theodorus*, lib. 5. Hist. cap. 34. about the year 402. mentions, that *Chrysostome* was banished by the Emperour *Arcadius*, but the first Night after his departure, the Emperours Palace was shaken by some terrible an Earthquake, that being frightened by that prodigy, he sent Messengers after him, and honourably received him, whom he had ignominiously thrust out. And *Ruffinus*, lib. 1. cap. 28. Writes that *Julian* and Jews were terrified from repairing the Temple at *Jerusalem* by a dreadful Earthquake, which they were earnestly endeavouring to effect before, out of hatred and ignominy to Christ. So God discovered his anger against *Diocletian* the Cruel Persecutor of the Christians, by an Earthquake, in which many thousand Men perished. *Theod. lib. 2. Hist. cap. 26.* when a Council was held at *Antioch*, where the Decrees of the *Nicen* Synod and *Athanasius* were condemned by *Arrians*, nor long after ensued a most grievous Earthquake, which lasting a whole year, was very destructive to *Antioch*. *Anno 347.* related by the *Tripur*. Hist. lib. 4. cap. 15. *Evagrius lib. 2. cap. 12.* *Funccius* in the year 344. and memorable in that which *Eutropius* notes about the time the *Arrian* Heresie and Tyranny spread through the *East*, that there were frequent Earthquakes, and that those places shook grievously. Neither is that which the same Author relates less remarkable, that presently after the
Death

Death of the Apostles *Paul*, *Laodicea*, and *Collossus* were swallowed up by an Earthquake, so that the punishment of those that contemned the Doctrine of *Paul*, might be conspicuous. And I seem not to have spoken rashly, when I said that no punishment or calamity is more grievous than an Earthquake, seeing 'tis an evil that can neither before seen, nor easily averted by any Remedies. *Pliny. lib. 2. cap. 82.* prescribes two Remedies against Earthquakes, viz. to dig many holes in the Earth, and make many passages there; but this is both labourious and almost as dangerous to Cities and Towns, as an Earthquake. But perhaps some body will say, we shall be safe in Rivers against Earthquakes. I confess there is some safety in Rivers, and *Synecius* whom I cited before, Writ is that in a great Earthquake; he thought the Sea more secure than the Land; but that doth not want its dangers neither; for the bottoms of Rivers are obnoxious to Earthquakes, as we shall shew in our Problems, and the Earth may easily gape under the Water or some heap of Earth plunged into the River from the Neighbouring shore, may overwhelm us, and sometimes Rivers us'd to be dried by Earthquakes, so that they that seek safety in the Rivers against an Earthquake, may find their Death and Grave. But I cannot conjecture what should be the meaning of that which *Agathias, lib. 5.* says, is the true Platonic Opinions, that he that perished by an Earthquake is to be esteemed more happy than he that saved from it. For if an Earthquake be a most grievous punishment, which the Scripture attests, he cannot be happy who is involved in an Evil, grievous in it self, and terrible to all Mankind.

75. *Lastly*, The Scripture speaks of an Earthquake as of a Sign or the forerunner of the last decretorial Judgment, at which a little before the end of the World, that great Judge will appear with the Angels of his Power, who himself, say *Luke 21. 11.* That there will be great Earthquakes in every place before his coming; And *Math. 24. 7.* He makes use of almost the same Words. The Prophecies of future Signs, respects both the destruction of the Temple and City of *Jerusalem*, and the end of the World. Therefore that which is asserted of great Earthquakes, may be accommodated to both those times. For *Josephus* diligently observes how great Earthquakes preceded the last sacking of *Jerusalem*.

76. Of this sorts of *σεισμοὶ μεγάλοι* good Men think that was, of which we are now treating, by which the Son of God in this last Age of the World, would warn and excite Mens minds, that they might

might seriously and timely prepare themselves for the great Sessions; and hear that Sentence either of Eternal Life or Death, never to be revoked. I see no reason why we should doubt that some Signs nearer and greater forerunners of the coming of Christ to Judgment than others. And therefore although this Earthquake be to be numbered among those Signs, as the ingenious and learn'd Mr. Beverly elegantly insinuates, yet 'tis likely there will be some other Earthquake more terrible, meerly miraculous and nearer the Day of Judgment. Which he may be applied to other Signs, as darkning of the Sun and Moon, may be gathered from 24 of *Matth.* and 21 of *Luke*, and from *Acts* 2. 19. where *Peter* cites that of *Joel*, *I will give Miracles in Heaven above, and Signs in the Earth below; Blood, and Fire, and the Vapour of the Smoak. The Sun shall be changed into Darknes, and the Moon into Blood, before that great and glorious Day of the Lord comes, &c.. Thou Lord Jesus come, come quickly, or if it seems good to thee to delay, grant that while the Earth shakes and Hell rages, while Kingdoms, Empires, and Kings are shaken and dashed one against the other, the Church, thy little Flock may enjoy, at least a moderate quiet and rest both here in England, and throughout the whole World. Amen.*

C H A P. IV.

Of the likeness or unlikeness of these two Earthquakes.

77. **I**T remaineth now, that we may examine, in what these two Earthquakes do agree, and in what they do differ, as well in their Forms and Causes, as in their Effects.

As to the Form, 'tis said in the 15th. *Theorem*, that the first was partly trembling and partly pulsative, according to the diversity of the plainness or unplainness of the Fields. But all do agree, that this last was some kind of panting or brandishing Motion, for the Earth was shaken laterally according to its Latitude; now that don't befall so in the Pulse or Vibration; and that sort of Earthquake is more frequent. Upon the lasting of the first all Authors do not agree: But as to this last, 'tis Witnessed from all

all places, that it did last two Minutes. I will only mention these words of Mr. *Edmond d'Amvigns*, Chaplain to my Lord *John Barbe*, Governour of the Cittadel of *Plimouth*, in his Relation of the most remarkable Transactions of the last Campaign, in the Confederate Army, where he was, pag. 61. *We felt an Earthquake, says he, which lasted about two Minutes, and shook the Earth very violently. It was felt at the same time all over Flanders, in many parts of England and France, and in other places of Europe, we had it about two of the Clock: It caused a great Consternation in our new Garrison of Dxmuyde; some thinking at first that the French had undermined several parts of the Town, and were in Ambuscades, going to blow them up.*

78. We may observe among the other Conformities of these two Earthquakes, these two chiefly, the Conformity of the Month; and the Conformity of the Day. Nay, we should make some consideration of the Time on the Day on both, to wit, that the first happened at two of the Clock in the Morning, the last at two of the Clock in the Afternoon, so 'tis only the intercalation of 12 hours; which Event is remarkable enough. But now in regard of the Conformity of the Month: We have observed in the 45 Theorem, that amongst the Planets, the Efficacy of *Saturn* did prevail that year. The same is happened this last year; as 'tis clear by the Observations of Mr. *John Partridge*, that Famous Mathematician, upon the Month of September: He says so, the Month of September begins with Quartile of *Saturn* and *Venus*. The Trine *Jupiter* and *Mercury* with a wet and windy Air. 2dly. 'Tis observed in the 46 and 47 Theorems, that the Power of the three superiours Planets, *Saturn*, *Jupiter* and *Mars*, is the most eminent in producing Earthquakes. Besides 'tis constantly affirmed, that the first Earthquake happened when the Sun was in *Virgo*. So were all these things disposed at the time of this last Earthquake. These are the very words of our forementioned Mathematician. *All the mutual Aspects of the Planets in this Month are Sol and Virgo, Luna and Libra, Saturnus and Sagittarius, Jupiter and Gemini. Mars in Libra, Venus in Virgo, Mercurius in Libra, Cancer in Libra. At last he doth conclude thus his Observations upon that Month. The Quartile of the Sun and Saturn, and the Sun and Jupiter, will in some measure influence September also, &c. To which we may joyn, the Temper of the Air in that very Month; whose first part was warm and wet by turns, but the most part warm and windy: so if we confer these things with what is said in the 52 and*

53 *Theorem*, we shall see that the Dispositions of the Air were the same, to wit, rainy Weather in the *Dry days*. There was also a very high *South-west* wind in that Month, tho' 'tis true that the Air was calm enough that very day when the Earth was shaken. *Lastly*, As these two Earthquakes had their Conformities in their Causes, so had they in their Effects, though not in such a high degree. 'Tis observed that there are three Effects proceeding from Earthquakes. 1. Universal sickness. 2. Overflowing of Rivers. 3. Scarcity of Fruit or Barrenness. As to the first, we did hear from many parts of *France* and *Italy*, that some Malignant Fever did appear, and 'twas reported that some kind of Plague hath been discovered in the Province of *Languedoc*. We must adore the Divine Providence, who hath kept this Kingdom from all these Mischief, wherein it was involved by so many Sicknesses, when the first Earthquake happened, in the last year of Queen *Elizabeth's* Reign. But as to the overflowing of Rivers, we had lately too many proofs of this effect, so that I need not to enlarge in the recital of many particular mischances that happened in many places almost overwhelmed, where several Persons have been lost by the Flood.

We should now come to examine the third effect of Earthquakes in reference to the first, that is the scarcity and barrenness. But we leave it to be felt and proved in *France*, where we know it is great. And though all sorts of Provisions are grown so dear since the Month of *December* last, in this Kingdom, and especially in *London*, yet that cannot be call'd scarcity; every one knows well enough the difference between dearth and scarcity. The continuance of bad Weather may always cause the same effect without any former Earthquake. We hope then that the same Divine Mercy which has preserved this Kingdom, and gathered therein so many thousands of Foreign Souls, and provided them with Bread seven years long by Miracle, will continue to send the same Blessings of Plenty unto this Nation, who hath pined his distracted People. The past Events being a kind of Security for the future. Whereupon we trust that God will spare these Islands, wherein the Candlestick of his Gospel, hath been kept fast, against all the Attempts of Popery. And so we conclude that the seven past years of Plenty are observable enough to put us in mind of the extraordinary and miraculous Providence of God for our Relief in a strange Land: So 'tis to be feared also that his design hath been to warn us by this present dearth, to be wary afterward, and to turn our selves from any abusing profuse-

ness of his Graces; otherwise the Bread staff of shall certainly be broken, it will be without strength; 'Tis the threatening he makes by Ezekiel against the Land which hath sinned and grievously trespassed against him, Ezek. 14. 13.

Some Problems as a Corollary both General and Special, which seem Naturally to rise from this Matter.

1. **W**Hether that be true which Pliny asserts, lib. 2. cap. 8. that France and Egypt are seldom shaken, by reason of the cold of the one and the heat of the other.

'Tis certain that in there the cold and Northern Countries Earthquakes are more rare, because the Earth being not so porous and loose, doth not so easily open a passage for the Wind, which is confirmed by Olaus Magnus, lib. 1. cap. 13. But yet Northern Countries are not free from Earthquakes, which History and Experience abundantly testifie. For in the year 1572. about the 6th. of January, a grievous Earthquake shook many both publick and private Buildings, in the County of Borussia, to their great damage. And in the year 1200. a great Earthquake threw down many Houses every where through Poland, as is related among others by Funccius, lib. 7. Chro. And even Sweedland and Denmark have felt Earthquakes; so that France which is more meridional and hotter, cannot be free from Earthquakes. And altho' Vapours and Winds are not easily generated in hot Countries, and if they are, they are easily dissolved, yet are these infested with Earthquakes. 'Tis true some write of Egypt, that there never was any Earthquake, because 'tis composed of the Mud that Nile when it overflows carries along with it, and so fitted to the former, that the Spiritus can find no Receptacles. Yet Seneca, Lib. 6. Natur. quest. says he dares affirm against the Authority of great Men, that Egypt is sometimes shaken. And there is a remarkable Disputation extant, concerning this in Agathias, Lib. 2. Hist. Eccl. 485. Where he say, About that time in the great City Alexandria situated by the River, an Earthquake was felt, which was short and for all, which

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all the Inhabitants (especially the more Ancient) esteemed as a great Miracle, because there never was any before, yet all being astonish'd at the wonderful and sudden Contingency; for fear came all out, which fear also invaded me, who was there for the sake of Laws and Litterature. Moreover, those that talk according to the Nature of things say, that Egypt cannot be filled with Vapours seeing it is low even, but that Opinion was then discovered to be weak. At the same time the Islands of Cos, in the Confines of the Aegean Sea were shaken by an Earthquake, but a little part thereof was preserved, the rest being levelled to the Ground, and variously and almost beyond Credit afflicted with Destruction; and when I did navigate from Alexandria to Bizancy or Constantinople, being carried by chance to that Island, such a lamentable Sight did fall under my Eyes, that it cannot be expressed by Words, &c. so says Agathyas.

2. Why Rivers decrease by Earthquakes? Pliny, lib. 2. cap. 8. Among other Effects of Earthquakes, mentions the adverse Courses of Rivers, others say backwards, because they understand it, as if Rivers ran back to their Fountains, by reason of the lifting up of the Earth in the Channel, which obliges the Rivers to a retrograde Motion. 'Tis commonly experienced that Rivers are lessened and considerably decreased by Earthquakes for the first days, which is within a few Months after followed by an Inundation. Rusa by Lucern, no contemptible River of Switzerland, was so lessened by an Earthquake in that place, where it first delivers it self out of the Lake, and where it used to be the deepest, that the bottom thereof shewed it self, and did not recover it self in October, which is accounted by the Inhabitants as a Wonder. About the time of the late Earthquake, there was observed a remarkable decrease in the River Necker, which the great Rain that fell before in June, July, and August could not prevent. And remarkable is that which Albertus Magnus, lib. 3. Meteor. tract. 2. writes, That Necker River in Swedenland was swallowed up by an Earthquake, so that for one day it appeared not for a Mile together. So we read in that Earthquake which happened under Theodosius, in the year 400. that were going to pass the Sea were seen standing on dry Land. And in the year 1536. about Toppa, in the Government of Judea, the Sea retired from the Shoar for 3 Miles, and the bottom of it remained dry 3 days, and the River Jordan 2 days, but after it came to the Shoar again, the River ebbed again with a full Channel, and the Waters of both of them were bloody, as is related by Geor. Agricola. lib. 4. de natura eorum quae effluunt à terra, pag.

pag. 140. There may be a threefold Cause assigned for this according to the several sorts of Earthquakes, for either the Fountains or Springs are obstructed by the Trembling, and by the heap of Earth thrown upon them, whereby the Fountain being stop'd there, the Vein of Water springs up in another place, as *Geor. Agricol.* relate of that Earthquake that shook the City of *Scalpra*, which we spoke of before, that a Sulphurous Fountain broke out of a Neighbouring Mountain. And *Theophrastus* attests that new Fountains discovered themselves whilst the Mountain of *Aulico* was shaken by an Earthquake. And an Earthquake did cause *Lados*, a River of *Arcadia* to spring up. And in the *Mithridatick* War, not only Lakes and Marshes, but new Fountains and Rivers sprang up by *Apamea* a City of *Phrygia*, the old ones having been swallowed up by the Earthquake: See *Geor. Agric. lib. de nat. rer. efflu. & terra* pag. 151. Also while the Vapours burst out of the Earth with great force, they so dilate and loosen the porous and sandy bottoms and sides of the Channels, that the Water of the River is sucked within the Earth, or lastly, the Channels of the Rivers being elevated by the Pulsus, turn the Waters back again, so that they are received into the Gavens of the Earth. That which is asserted of the stopping of Earthquakes by the tract of Rivers, is not usual in any places where the Bottoms and Banks of Rivers are very porous and gravelly, when there is no Vapour stirring, but that which is very near the Superficies of the Earth, so that being repelled by the hardest parts of the Earth, which it could not penetrate, 'tis carried to the River-banks, which by reason of their porosity yielding a Passage it sooner exhales.

But when the Channels of Rivers are more solid and rocky, and when the Wind that moves, is deeper within the Earth; and lastly, when the coldness of the Water is an hindrance to the exhaling of the Vapours, Earthquakes stop not at Rivers, but gather strength and impetuously rage under the Earth, which is noted by *Pliny*, *lib. 2. cap. 8.* where he says, *That those who sail in a Calm, easily guess when there is an Earthquake by the sudden swelling or soaking of the Waves, and those things that are in the Ships shake as much as in Houses, and declare it by the noise they make; neither can the Birds sit without shaking and fear.* Which was lately experienced and attested by those who were upon the *Necker* and the *Rhine* the 8th. of *September*, especially by the Fishermen. whose Boats were strongly assailed by the Vapours falling out of the bottom of the River, and Bubbles arose on the top of the Water, which is a certain Indication of the Combat of the

Water with the Vapours at the bottom of the River, and the violent propulsion of the Rivers in the manner of a Wave; sometimes to this Bank, sometimes to the other, discovered the Trembling and Vibration of the bottom. So 'twas observed in that grievous Earthquake, which shook *Ferrara* in the year 1570. that the River *Po* was much troubled by the leaping of Bubbles into the Air: which much confirms me in the Opinion I propounded before of the deepness of the Vapours that caused the late Earthquake's great extension and velocity: for the Vapours that is but shallow, quickly exhales through the Channels of Rivers, so that neither rages nor is perceptible there, as is in like manner argued by the renowned *B. Arctius*, *Prob.* 172. where he thus writes; *On the 6th. of April 1569. an Earthquake happened in many places;* for 'tis apparent 'twas at the same time at *Bern*, at *Tbunn*, at *Strasbourg* and many interjacent places, and that which is worthy of our admiration is, it shook both the Banks of the River, when at other times it hath been observed Earthquakes used to end at Rivers: Whence it may be gathered its rise was very deep.

3. Why are those places that are either lying upon, or encompassed by the Sea or some River obnoxious to Earthquakes, as *Aristotle* lays, *lib. 2. Meteor. cap. 8. Earthquakes are most violent in those places that the Sea runs by, where the Country is loose and hollow, as about the Hellespont, Achaia, Eubœa, Sicily, for the Sea seems to run under the Ground through the Straits about those places:* Neither is that place at the end of the same Chapter contradictory to this; for, says he, *there are no Earthquakes in the Isles of Pontus, (for so is the Word to be rendred, and not in the Marine Islands) or very rarely.* He only insinuates there, that there are not so violent ones, as in other Islands, by reason of the cold of the Sea verging to the North, by which the Vapours are thickned and made lumpish. *Pliny* follows *Aristotle*, who took most of what he hath of Earthquakes out of him, *cap. 8. de ortu Subter. pag. 29.* where he says, *The Mountainous and Marine places are more especially infested with Earthquakes, because they abound with Veins and Caverns made by the Subterraneous Rivulets, that secretly disburthen themselves into the Sea, or Lakes that are under the Mountains.* And experience teaches us, that *Cyprus, Sicily, Eubœa, Molucca*, and those other Islands called *Terite* are often grievously shaken by Earthquakes, which *Bernardin Scalantus* and others relate of the Islands *China*: And the reason is manifest, because those cavernous and porous places intercept the Humours in their Cavities,

of

of which, Vapours are engendred, which when they endeavour to fall out, are obstructed by the Waves of the Sea, and so they are again hid in the Bowels of the Earth, the cold on every side enclosing them and hindring their evaporation, so that being agitated by this conflict, that is, heated and attenuated, they must necessarily shake the Earth. Neither are Islands only, but the Continent also, obnoxious to Earthquakes, though not in Campaign places, which are seldom shaken, because they commonly have Caverns, as is observed in *Germany* and *France*, as *Georg. Agricol. lib. 4. de effluentibus à terra* observes.

But *Constantinople* and *Basil*, in that part that borders on the Sea, or a great River are examples of this; the one of which of all the *European*, and the other of all the *German* Cities, is most infested with Earthquakes, as we shewed before of *Constantinople* out of *Agathias's* History; but *Procopius* plainly attests, that *Constantinople* shook for forty days together in the year 554. and in the year 740. it was shaken twelve months together, beginning on the 7th. of *November*, as is noted among others by *Funccius*. But in later Ages even in our own and Fathers memory, we have heard of frequent Earthquakes in that City, which was felt by *A. Gilpin Buisbequin* among others, and writ by him in the Epistles of his *Turkish Embassy*. And *Stumpsius* and others have writ, how often and grievously *Basil* hath been shaken. *Benedictus Arretius* in the aforesaid Problem reckons up ten times, that *Basil* was shaken with great danger and loss in the space of 800 Years. In the Years 801, 814, 829, 1021. when the whole City was almost destroyed, the Church with many Houses being thrown into the Rhine. And again, in the Year 1062, when a grievous Plague ensued upon the Earthquakes, again in the Year 1356. on the 18th. of *October* it shook ten times about Evening, so that the Church, Walls, Towers, and a great part of the City being destroyed by it, there were a 100 Men killed. *Stumpsius* says, *Lib. 12. cap. 28.* That the Earthquake continued all that year, and that *Basil* shook ten times in an hour. In the following Year 1357. there happened another also in the Year 1414. as likewise in the Year 1456. it shook again; but in the Year 1533. most terribly, as we read in *Munster*, not without great Commotion of Mind. The late Earthquake was not a little perceived at *Basil*. And *Mentz* hath sometimes been dangerously shaken by Earthquakes, and that thrice between the Year 855, and 880. and the first time the Walls and the Church of *Urban* fell down. *Constance* also by the Lake of the *Rhine* trembled nineteen times.

times the same day, in the Year 1295. The People of *Strasburg* often ran to their Tents out of the City, by reason of the danger they were under from an Earthquake, especially in the Year 1357. But I think there is no City upon the *Rhine*, or in *Germany*, that is more frequently or dangerously shaken than *Basill*; the reason whereof a Traveller seriously thought, when he was viewing its Scituation, than which a more pleasant one he never had seen, nor was like to see, and he thus considered with himself, that the Cause of so great and so many Earthquakes in that place was partly common with other Cities seated by Rivers, and partly proper and peculiar to that place. The common Cause is, that the River passing by the City makes the Earth chinky, and then pours in Water into those Caverns it hath made, which deeply penetrating the Earth, engenders Vapours which being obstructed by the cold of the Water, *κατ' ἀντιστάσιν*, cannot evaporate, but being kept within the Earth longer time and variously agitated, are turned into blasts and winds adapted for Earthquakes, but the peculiar and proper Cause of Earthquakes in that City is; first, because the *Rhine* is there narrower and more contracted, and being thus imprisoned, seeing it cannot overflow the Banks, it is carried more impetuously, the force of the Water being contracted within it self, and as it were, by undermining it makes the deepest places of the Channel and Banks hollow and more cavernous than in other places; so that more Vapours are apt to be generated and tarry there where they find a receptacle, being also enclosed and shut in by the cold of the Water or River. Another Cause is the many Dens and Caverns that are in a high Hill by the *Rhine*, adapted for the reception of Vapours, the Passage of which is easie and plain through the Pores of the Earth leading to the *Rhine*. To which may be added that this Hill scituate on the *Rhine*, whereon a great part of the City is built, hath every where a solid Superficies which is stony, so that many Vapours being engendred by the River flowing by, and imprisoned within the porous and cavernous Earth, cannot conveniently exhale through those ways which they naturally seek, but being denied a passage, and collected and coarcted by their strife and reciprocation, and so gathering strength by their heat and rarity, they impetuously invade and shake that which hinders them from above. Lastly, 'Tis probable there is much Subterraneous fire, where *Basill* stands, or not far from thence, as there is at *Baden*, which is distant but one days Journey from *Basill*, where there are many and great Baths, as is usual in such places, Exhalations
falling

fallying out of the Earth even under the Waters of *Limage* that flows by it, which grows hot at the bottom by the Subterraneous Exhalations, as is often felt by those that go naked into that River. Moreover, reason it self discovers, and the examples of flames often breaking out in an Earthquake testifie, what great power Subterraneous fires have to move the Earth, if they be shut up within the Earth. So that *Geor. Agricol.* truly says, *lib. 2. de ortu & cau. Subter.* pag. 27. *That hot places, and where there are many hot Vapours, are obnoxious to Earthquakes, because Subterraneous fire is apt to beget a quantity of smoaky Exhalations sooner than a little heat.* Yet *Baden* that hath so much Subterraneous fire is seldom shaken, which is because the Exhalations there break out in great quantity, through the looser and thinner Superficies of the Earth in regular Ways and convenient to their Nature. And if the Superficies of the Earth were so dispos'd at *Basill*, that the hot Water, which are perhaps in the Earth could have a passage and sily into the open Air, their Vapours would exhale in a suitable way, and would be a certain remedy against frequent and dangerous Earthquakes: Which since nature hath denied, perhaps it might be effected by Art, by every where digging and opening Caves towards the City, which might exhale the preconceived Spiritus, which is observed in some Towns which are seldom shaken, having some Caves digged to make a passage for the Water; which remedy *Pliny* prescribes, *lib. 2. cap. 82.* But I hope, God who hath vouchsafed to commit the heavenly Doctrine and Academy as a precious pledge and gage to it, will hereafter preserve that remarkable City from those grievous Concussions whereby Cities use to be destroyed.

4. What credit may one give to the Relation of *Plato* of the Island *Atlantis* drowned by an Earthquake? *Pliny lib. 2. cap. 9.* where he says, an Earthquake took away all the Ground where *Atlantick Sea* is if we credit *Plato*. Which relation of *Plato's*, that *Pliny* hints at, is extant in *Timeus*, where he boasts of the Antiquity of the *Athenians*, who waged War for many thousands of years before, with the Inhabitants of the Island *Atlantis*, which he says, was greater than all *Africa* and *Asia*, and was afterwards buried in an Earthquake, the *Atlantick Ocean* being let in upon it. The Island *Atlantis* was swallowed up in a great Gulph, which made it unnavigable by reason of the Mud of the Island that was suck'd in. Then that *Atlantick Sea* was Navigable, for it had an Island before its Mouth, which you call the Pillars of *Hercules*: Which Island was bigger than *Lybia* and

and *Africa* together, from whence there was a passage to other Islands, and to all the Continent over-against it, round about scituated near the vast Sea.

There are those that would erect two great Geographical Theses from these Words of *Critias*. First, That the *America*, or that which we call the New World was known to the Ancients, especially to *Plato*. 2dly, That the first Inhabiters of it came from the Continent of *Asia* into *America*, viz. by the *Atlantick* Isle. To gain Credit to which Assertion of their own and the Authority of *Plato*, they make the Scituation of places so, that they say the Island *Atlantis* possessed a great part of that Sea that is now called the *Atlantick*, that the Islands to which they ascended from *Atlantis*, were those that are by the Marriners at this day called *Barlovent*, *Cuba*, *Spanish*, *St. John Bosquen* and *Tamaica*: From these places there was a way to the Continent, now called *Terra firma*, and so to the Kingdom of *Peru* and *America*. If you ask what that Continent is, which *Plato* says, is scituated about *Pontus*? They answer, 'Tis that Southern Sea commonly called *Sur*, which is called *Pontus*, by *Plato*, in respect of its greatness, if compared with the *Mediterranean* and *Atlantick* Sea. Those that more nearly consider the thing it self, and the Relation of *Critias*, think all this, is asserted more out of a too great deference to the Authority of *Plato*, than any probability in the thing it self. For that which he asserts of the unnavigableness of it, by reason of the drawing of *Atlantis* in the Ocean, is refuted by frequent Navigations thither: and those Wonders *Critias* relates of the Origin of *Atlantis* are altogether fabulous, as also of its incredible felicity, and their waging War with the *Europeans*, of their Temple built in the length of a Furlong, whose external Parts were filled with Silver, the highest with Gold, and within there was an Ivory Arch chequered with Gold, Silver, and Copper. What Ruines of *Atlantis* are now to be seen under Water, as he asserts? to wit, by those that cannot sail thither? but what Earthquake is so great, in which a Country bigger than *Africa* and *Asia* may be sucked in? or what Sea is so great, that could swallow up so great a Country, so that its bottom can be sounded by no Plummer, which Seamen attest. But say they, *Critias* tells *Timæus* before, that his Discourse would be wonderful, but yet true. But what if things answer not words? who would believe that to be true, where he says, *That Neptune falling in Love with Clito, had Twins five times by her, divided one Hill into five Orbs, two of Earth and three of Sea?* and that the *Atlantick* Sea can derive

derive its Name from nothing but *Atlantis*, is too weak to be erected. For there is the Mountain *Atlas*, in the middle of *Mauritania*, from which it is called the *Atlantick Ocean*, as *Pliny* says, *Lib. 6. cap. 5.* Where he also asserts the little and contemptible Island *Atlantis* was situated over-against that Mountain.

Yet we must confess that oftentimes great part of the Earth is swallowed up by an Earthquakes, Examples of which *Pliny* recites, *lib. 2. cap. 91, 92.* And not a few received their Birth from the same Cause, as Nature would be even with her self, as *Delos* that received from thence its Name, *Rhodus*, *Naxos*, *Thera*, *Therussa*, *Aenaria*, which the *Greeks* call *Pisiansa*, and three others not notified by any proper Names, of which the first rises up among the *Acolian* Islands, the other near *Creta*, the third in the *Toscan Bay*. Sometimes the Sea hath broke in upon the Land by an Earthquake: So *Sicily* was separated from *Italy*, *Cyprus* from *Syria*, *Eubœa* from *Bœotia*. *Pliny*, *lib. 2. cap. 88.* And perhaps *England* from *France*. *Servius* explaining that Verse in *Virgil*, *Et postibus toto divisos orbe Britannos*, seems to be of this Opinion; formerly, says he, *Britain* was joined to the Continent; the Sea between *Kent* and *Calice* lifts it self up so high, and is so closely contracted, that many are of Opinion, that the Ground being dug there let in the Sea that was before excluded, which is also alledged by *William Camden*, that accurate Writer, in his *Chorographical Description of England and Scotland*; yet he puts off that Question from himself, as also another, which is, Whether Islands were before the Flood? Of which may be consulted *Benedictus Bordonius*, who writ a Description of all the Islands of the World.

5. Whether exterior Wind entering the Earth from above is able to move it? Of which Opinion were not a few of the Ancient Philosophers *Archelaus Callisthenes* and *Metrodorus Chius* think that the Wind which enters the Earth through those *Foramina* which lie open, either to the Sea or to the Air, is the Cause of Earthquakes. Yet *Archelaus* doth not explain by what passages the Wind that moves the Earth penetrates into it, either through those secret ones that lie hid under the Sea, or through the open ones, or both. *Callisthenes* was of Opinion, 'twas by the latent passages under the Sea. But *Metrodorus* thought the Wind fell from above on the Earth, which is included in the Caverns. So they both were of opinion, that some Wind insinuated it self into the Caverns of the Earth, which was followed by more and more, which so pressed and strained the former, that finding no exitus it turned its force against the Earth and shook it.

Which opinion of the Ancients, *Geor. Agricol lib. 2. de ort. sub.* battering to pieces, says, The exterior Wind doth not seem able to effect an Earthquake, because its Particles entering into the vast Caverns are dissipated, or being contracted together have not so much force, for the Cold in so long a space of Air extinguisheth its heat. *Arist. lib. 2. Meteor. cap. 7.* and 8. makes no mention of exterior Wind, but ascribes Earthquakes totally to the Vapours engendred within the Caverns of the Earth: In *Lib. de Mund.* If that be *Aristotle's*, *cap. 4.* he thus writes: "It often happens that exterior Wind breaking into the Cavities of the Earth, being excluded any Exitus, by turning it self within, shakes the Earth with great force; which may I think be thus reconciled, if we say an Earthquake regularly *ὡς ἐν τῷ πᾶσι*, is caused by Vapours which are engendred within the Earth, but sometimes it may happen, that an exterior thicker and moister Wind being as with a Whirl wind thrust into the Caverns of the Earth, is mingled with the Subterraneous Vapours, and so conjoynly with them shakes the Earth, when it could never separately and by it self. To this I will add, that those that attribute Earthquakes to infernal status, differ in their Opinions: for some say that the Earth being void of all Life and Sense, hath some Spiritus engendred together with it, which Opinion, is constantly defended by *Aristotle*. But there were others formerly who attributed such a Life and Spiritus to the Earth, as in the bodies of Plants, and vital and animal Spirits, as there is in Animals; which Opinion is espoused by one of the Physical Writers; all other Philosophers that I have seen, are of *Aristotle's* Opinion; as being most constant to reason and experience. For seeing the Earth is a Principle and Element of all mixt bodies, consequently every mixt body would live; yea, the Earth would be no longer an Element if it had life, for living bodies have received their last complection and perfection, which cannot be asserted of Elements, which are designed by Nature for the constitution of fuller bodies, as the Principles of all mixt bodies. But let us see how the Earth is moved supposing it lives; as in the Body of Man, say those, who are of that Opinion, when 'tis well, the Veins through which the Blood and Spiritus pass, are not disturbed, but when 'tis not well, they never leave panting: so the Earth, when 'tis in its natural situation, Vapours are quickly diffas'd through its Veins, is obnoxious to no Earthquakes: but when it hath not its own situation, and the Vapours intangled with Ruin and Mud, find not a free passage through the Veins, then there must necessarily happen a shaking of the

the Body of the Earth, so the Earth is therefore moved by them, because 'tis in a Fever. *Seneca lib. 6. natur. quest.* thus attacks that Opinion: *If,* says he, *the Earth like an Animal is moved from this Cause, it will all feel vexation, for a Fever in us doth not more moderately impel some parts and others move quickly, but runs through all with an equal degree.* But Physicians will think this reason of *Seneca's* weak; for one Member of an Animal may be infested *πάλιν*, with a trembling or palpitation; so that if we grant the Earth lives: part of it may tremble and be shaken alone, for altho' it hath not either Nerves or Muscles, yet it hath Veins and as it were Pipes on every side fill'd with Spirits.

6. Whether Subterraneous Exhalations are generated by the Sun Beams? *Aristotle's* constant Opinion is, they are generated partly by the heat of the Sun influencing them from above, partly by the heat of Subterraneous fire every where dispersed through the Caverns of the Earth, as he speaks, *lib. 2. Meteor. cap. 8.* 'The Earth of it self, says he, is dry, but it receives great moisture from Rains, which growing hot by the Sun and the heat in the Earth, begets much Vapours, both without and within the Earth; which Opinion is therefore disapproved of by *Geor. Agricol. lib. 2. de orn. Subter. pag. 25.* because the Sun draws all the Vapours it begets out of the Earth. But *Aristotle* will easily answer, *That some Vapours are therefore heated by the Sun, that they may be drawn out; but some are engendred so deep within the Earth, that they cannot be drawn out.* I confess heat draws moisture to it self; doth not drive it away, but it doth not draw out all its draws to it. Neither doth that presently obtain the end that acts for an end. The Refiners of Metals and Mines fetched out of the Veins of the Earth, must needs, says *Agricola*, 'To hew a Ditch on the Earth under the Crucible, to draw thither all dampness, for fear lest otherwise, the strength of fire drawing out the moistness of the Earth into the Crucible, it would grow swelled and burst to pieces with sudden loss and squandering away of the Metal; If the heat doth draw to it self the moistness, much more can it put in a motion an Exhalation, and draw to it a Vapour which is of the same kind with it self. This is true, yet they do not evince that; which they were to prove, that the heat of the Sun doth draw out presently that Exhalation and set it at freedom, which it draws to it, that's not altogether in the power of the Sun, there are these things that detain that Exhalation engendred within the Earth, that it cannot fly whither it is drawn.

7. Whether *Aristotle* for any certain Reasons, appoints more solemn times for Earthquakes? We noted before in the 28 *Theorem*, that *Aristotle* was of opinion that Earthquakes commonly happen about the Equinox, in *Spring* and *Autum*: but the accurate Searcher of Subterraneous things, *Geor. Agric. pag. 29.* is of another opinion; where, he says, When I examine his Reasons why Earthquakes happen oftner in *Spring* and *Autumn*, than in *Summer* and *Winter*, by night than day, in the night time at the breaking of the day softest, in the day time at noon, I find them weak and of little force, for he attributes all to the Sun, which he doth because, if it be without this, the Earth at all times of the year would have the same disposition in it: 'The Sun, says *Agricola*, cannot be the Cause, much less the 'Moon's Eclipse; because if the presence of the Sun conduced to 'this, more Earthquakes would happen in *Summer*, than in the *Spring* 'or *Autumn*; more in day time, than in the night; and if its absence be influential, there would be more at midnight, than at break 'of day, in *Winter*, than in the *Spring* or *Autumn*. *Aristotle* observed not that the scorching of the Sun heating the Earth, draws those Vapours out of the Earth, not shuts them in it, that were neither generated by it, or were touched by internal heat after their generation. But this is that *νεαύμενον*, of which we disputed in the preceding Problem. The Sun engenders Exhalations, which when they fly into the Air of their own accord, are said to be drawn and extracted by the Sun, but I do not grant that (speaking properly) the Sun draws forth Exhalations. But let us speak as the custom is, that the Sun doth draw Exhalations towards it, does it therefore draw them out of the Earth? *Agricola* excepts: 'There is no stopping, 'says he, that hinders those which the Sun produces; for it would 'not engender them unless its virtue could pierce into the upper 'part of the Earth, and the Sun excites the Exhalations out of the 'Earth, by the same way the power of the Sun penetrates into the 'Earth, and so doth not imprison them within the Earth. The Reader sees, how ready an Answer is for *Aristotle*. 'The Sun, says 'Agricola, would not beget Exhalations unless it could bring them 'forth out of the Earth, yea, it begets many not to extract them, 'but to afford matter for the generation of Metals within the Earth, 'as Gold, Silver, and also for the generation of Minerals, as Sulphur, Brimstone, whose form is so excellent and profitable, that it 'may be called the end, for which that Celestial Body efficaciously 'operates in and under the Earth by its Rays. But as we answered before.

before, Natural Agents are not so ordered, as always to attain the end of their operation, because they act not deliberately, and cannot suspend the Action. The Sun engenders Exhalations, by the intimate power of its Rays, whither it be able to bring them into open Air or not, neither doth the eduction of them belong to the nature or perfection of the Sun, but of the Exhalation, whose natural (place, that is, that which it most desires,) is in the Air. But seeing the frequency of Earthquakes both in *Autumn* and *Spring* is attested by the experience of all Times, what reason shall we assign for it, if that which *Aristotle* hath given, is not available? *Agricola* answers, *Because the internal heat of the Earth sometimes procreates many Vapours, sometimes few, and where many are imprisoned, they cause Earthquakes in all times of the year and day.* But with the leave of so great a Man, this is nothing else than to ask what is in the Principle or in Question; for why sometimes more, sometimes fewer Vapours are generated, is that, that is inquired after; which cause is not within the Earth, but altogether depends upon a Celestial Body, which as it is first, so it is most efficacious, both on the Earth and other Bodies.

8. Why are Birds frightened in an Earthquake, as is attested by *Pliny*, lib. 2. cap. 81. *Birds also*, says he, *sit not without fear in an Earthquake?* 'Tis no wonder if Terrestrial Animals are frightened, while the Earth trembles, but how can Birds, while they pass through the Air, perceive what the Earth suffereth? Birds have a thin and subtil, that is to say, an airy constitution of body, so that they easily perceive every little alteration of the Air, and it is past doubt that the Air may be affected and altered by an Earthquake, especially in *Asia*, and those places where the Air is more thin and subtil.

9. Whither the Vaults in Houses are safest? *Pliny* doth affirm it in his 2d. Book, cap. 83. 'Where prescribing Remedies and Aids against Earthquakes, he says, Vaults and corners of Walls and Posts alternately thrusting against one another; where he speaks, I believe, of Subterraneous Vaults, in which the Vapours being received in a more capacious place, do not rage so much, as in a narrow one; altho' a greater Percussion may be in a hollow and round place, than in a level. Those Roof and Arches that are above the Earth, are not a little infested with Earthquakes: which we see by experience in the late Earthquake in *Switzerland*, where the Roofs of many Churches were very much cracked. At *Lucern* the *Franciscan's* Church

Church was so shaken, that the Roof hanging over the Chorus was demolished, that it must all be repaired a new: and no doubt many such like things happened in other places by the same Earthquake.

10. Was the late Earthquake so ended, that the Countries through which it went, are secure from its iteration? We observed before two sorts of Earthquakes, some are continual, that is, either continually ceasing or lasting; and some interrupted or iterated at distinct times. In the year 554. *Constantinople* shook forty days together, as *Procopius* attests, and in the year 740. a great Earthquake beginning on the 7th. of *November*, lasted there a whole year, as is observed by *Funccius*, pag. 128. *Chro.* But this, I believe was an interrupted and not a continual one. In the year 480. as is related by *Eutropius*, lib. 10. an Earthquake shook *Germany* a Month together. And remarkable is that which is related, lib. 4. *Hist. trip. ar.* In the year 344. an Earthquake shook first *Antiochia*, and then almost all the *East* a year together, when the preceding year the *Arrian* Faction assisted with the protection of *Constantius*, had most cruelly persecuted both *Athanasius* and the whole *Orthodox* Church, which we also mentioned before. In the 19th. year of *Friderick* the 1. *Syria* and *Sicily* begun, and afterwards continued for many years together to shake; some Towns being indamaged, others demolished, and a dreadful slaughter made of living Creatures, as *George Agricola* relates, out of the History of those times, lib. 4. de nat. efflu. e terra. pag. 151. where he adds, that an Earthquake happened at *Seville* and *Cordoua* in *Spain*, which lasted three years, which is very remarkable. In the year 741. twenty Earthquakes almost continued, shook *Wiritzbourgh*, as *Funccius* observes. In the year 1276. twelve Earthquakes shook *Germany*, there being but a little space of time between them, as is witnessed by *Strumpfius*, lib. 5. cap. 1. In the year 1295. an Earthquake was repeated at *Constance* 19 times. In the year 1531. a great Earthquake was iterated 8 times at *Olyssippa* or *Lisburn*, in *Portugal*. In the year 177. *Basil* was shook 9 times in 9 months. That Earthquake which happened in *Queen Elizabeth's* Reign, was also interrupted, that is to say, was repeated; so that between the first and second time (at which time it was not so vehement in these places as at the first) it interposed about a quarter of an hour.

But that which was inquired after in the propounded Problem was, whether the matter of an Earthquake reaching so far was consumed in

in those two shakes. I would not here rashly assert any thing, nor frighten my self with sinister Omens: I will only mention that, which if not necessarily, yet truly may be determined for Physical Principles of interrupted Earthquakes: I will lay the *Theorem* in order. *First*, When there happen a great Earthquake, that reaches far and near, all the Vapours collected in the Earth shake it not together and at once, but are interrupted for forty days, then for a year, and sometimes they threaten another Earthquake in the same place for two years; for Vapours may be contain'd so long within the Earth. This *Aristotle* asserts almost in so many words, which is also confirmed by the experience of these examples we have cited, and by such others: which also *Aristotle* explains by a very apt Similitude; *As the unnatural Pulses in our Bodies*, says he, *do not presently, but by degrees and interruptedly end with the Disease*: so winds do not sooner leave off shaking the Earth, than the Relicks of them are consumed. Another Physical *Theorem* is, That interrupted Earthquakes commonly return in a more vehement manner; for the longer the Vapour contends within the Earth, the stronger 'tis rendred. The third *Theorem* is likely, That as *Pliny* writes of the Plague, *Lib. 7. cap. 59.* That it hath been a long time experienced, that it goes from East to West, and if it happens otherwise, it every where prevails: So an Earthquake goes from the South to the North, from East to West. This is also certain that there are two sorts of Interruptions, one quick, when 'tis suddenly iterated, the other slow when 'tis repeated after many Days and Months. The last Earthquake had not any sudden renew all, but we have reason to fear a slow one. To which we may add that the Eclipse of the Sun on the 27th. of *December*, threatens us with its effects, and the Conjunction of *Saturn* and *Mars* in *Scorpio* may add to it: of which this is their Rule; *Saturn* in *Mars* shakes the Earth, which Rule experience confirmed in the year 1542. when after the same Conjunction a great Earthquake shook *Constantinople*: And there will be a Conjunction of *Saturn* and *Mars* in *July*, as there was in *October* 1531. when *Portugal* was grievously shaken. But we must refer the care of futurities to God: 'Tis our duty to rest on his eternal presence, to correct past things, and live now more chastly and piously as *Mr. Beverly* learnedly and fervently exhorts in his Treatise of Trepidations of the Earth, pag. 132. which that we may do, God Almighty grant, who alone can move Mens Hearts as he doth the Earth.